

Final

**Biological Survey Summary Report
Volume I**

Battle Creek Salmon and
Steelhead Restoration Project

Submitted to:

Navigant Consulting, Inc.

In association with:

U.S. Bureau of Reclamation

Submitted by:



Jones & Stokes

Sacramento, California

April 2001

Final

Biological Survey Summary Report

Volume I

**Battle Creek Salmon and
Steelhead Restoration Project**

Prepared for:

Navigant Consulting, Inc.
3100 Zinfandel Drive, Suite 600
Rancho Cordova, CA 95670
Contact: Don Wagenet
916/852-1300

and

U.S. Bureau of Reclamation
2800 Cottage Way
Sacramento, CA 95825
Contact: Mary Marshall
916/978-5248

Prepared by:

Jones & Stokes
2600 V Street
Sacramento, CA 95818-1914
Contact: Steve Centerwall
916/737-3000

April 2001

Executive Summary

The U.S. Bureau of Reclamation (Reclamation), Mid Pacific Region, and the State Water Resources Control Board (SWRCB) are the federal and state lead agencies, respectively, for the Battle Creek Salmon and Steelhead Restoration Project (Restoration Project). Reclamation and SWRCB are working cooperatively with Pacific Gas and Electric Company (the Licensee), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service, and California Department of Fish and Game (DFG) to reestablish salmon and steelhead habitat on Battle Creek by modifying the Battle Creek Hydroelectric Project, Federal Energy Regulatory Commission (FERC) Project 1121 (Hydroelectric Project). Jones & Stokes was retained by Navigant Consulting, Inc., to conduct biological resource studies to support the preparation of a joint National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) document and associated state and federal permits that will be required for the Restoration Project. This report presents information on botanical, wetland, and wildlife resources in the project area.

No state-listed or federally listed plant species were located in the project area during the spring and summer 2000 field surveys. Bald eagles (*Haliaeetus leucocephalus*), federally listed as threatened and state-listed as endangered, were seen flying over several project sites; however, no active nests were found within the study area. Thirty-four blue elderberry shrubs (*Sambucus mexicana*) were identified as potential habitat for valley elderberry longhorn beetle (VELB), federally listed as threatened; however, no VELB were observed in the field. In addition to bald eagle and the suitable VELB habitat, little willow flycatcher (*Empidonax traillii brewsteri*), state-listed as endangered and a federal species of concern, was observed in the project area.

Sensitive Plant Communities

The following sensitive plant communities were documented in the Battle Creek project area during field surveys:

- emergent wetland,
- seasonal wetland,
- emergent scrub wetland,
- groundwater seep wetland, and
- riparian forest and scrub.

Special-Status Plants

The following nonlisted special-status plant species were documented in the Battle Creek project area during field surveys:

- depauperate milk-vetch (*Astragalus pauperculus*), a CNPS List 4 species;
- woolly meadowfoam (*Limnanthes floccosa* ssp. *floccosa*), a CNPS List 4 species;
- shield-bracted monkeyflower (*Mimulus glaucescens*), a CNPS List 4 species; and
- Bidwell's knotweed (*Polygonum bidwelliae*), a CNPS List 4 species.

Special-Status Wildlife

The following special-status wildlife species were observed in the Battle Creek project area during field surveys:

- foothill yellow-legged frog (*Rana boylei*), a federal species of concern;
- northwestern pond turtle (*Clemmys marmorata marmorata*), a state species of special concern;
- osprey (*Pandion haliaetus*), a state species of special concern;
- sharp-shinned hawk (*Accipiter striatus*), a state species of special concern;
- Cooper's hawk (*Accipiter cooperii*), a state species of special concern;
- golden eagle (*Aquila chrysaetos*), a state species of special concern, a state fully protected species, and protected by the Bald and Golden Eagle Protection Act;
- Vaux's swift (*Chaetura vauxi*), a state species of special concern;
- little willow flycatcher (*Empidonax traillii brewsteri*), state-listed as endangered and a federal species of concern; and
- yellow-breasted chat (*Icteria virens*), a state species of special concern.

Many unidentified bats were seen at dusk during field surveys. The following are species that potentially occur in the project area (Zeiner 1990a):

- fringed myotis (*Myotis thysanodes*), a federal species of concern;
- long-eared myotis (*Myotis evotis*), a federal species of concern;
- small-footed myotis (*Myotis ciliolabrum*), a federal species of concern;
- long-legged myotis (*Myotis volans*), a federal species of concern;
- Yuma myotis (*Myotis yumanensis*), a federal species of concern;
- pallid bat (*Antrozous pallidus*), a state species of special concern; and
- Townsend's big-eared bat (*Plecotus townsendii*), a federal species of concern.

This document should be cited as:

Jones & Stokes. 2001. Biological Survey Summary Report, Volume I, Battle Creek Salmon and Steelhead Restoration Project. Final. April. (J&S 00-050.) Sacramento, CA. Prepared for Navigant Consulting, Inc., Rancho Cordova, CA, and U.S. Bureau of Reclamation, Sacramento, CA.

Table of Contents

	Page
Chapter 1. Introduction	1-1
PROJECT OVERVIEW	1-1
ORGANIZATION OF THIS REPORT	1-3
Chapter 2. Study Methods	2-1
BOTANICAL AND WETLAND STUDY METHODS	2-1
Special-Status Plant Surveys.....	2-2
Plant Community Characterization and Mapping.....	2-4
Noxious Weed Survey	2-4
Delineation of Waters of the United States (Including Wetlands)	2-5
WILDLIFE STUDY METHODS	2-5
Special-Status Wildlife Surveys	2-6
Chapter 3. Study Results	3-1
PLANT COMMUNITIES AND ASSOCIATED WILDLIFE HABITATS	3-1
Common Plant Communities and Associated Wildlife Habitats	3-1
Sensitive Plant Communities and Associated Wildlife Habitats	3-5
NOXIOUS WEEDS.....	3-9
SPECIAL-STATUS PLANTS.....	3-9
Woolly meadowfoam.....	3-10
Depauperate milk-vetch	3-11
Shield-bracted monkeyflower.....	3-12
Bidwell’s knotweed	3-13
SPECIAL-STATUS WILDLIFE.....	3-15
Valley elderberry longhorn beetle	3-15
Northwestern pond turtle	3-17
Foothill yellow-legged frog	3-19
Osprey	3-20
Bald eagle.....	3-21
Sharp-shinned hawk.....	3-23
Cooper’s hawk	3-24
Golden eagle	3-25
Vaux’s swift	3-26
Little willow flycatcher.....	3-28
Yellow-breasted chat	3-29
Special-status bats.....	3-30

Chapter 4. Constraints Analysis and Potential Mitigation Measures.....	4-1
Chapter 5. List of Preparers	5-1
Chapter 6. Citations.....	6-1
PRINTED REFERENCES.....	6-1
PERSONAL COMMUNICATIONS.....	6-5
Appendix A. U.S. Fish and Wildlife Service Memorandum to the Bureau of Reclamation, Sacramento, California	
Appendix B. U.S. Fish and Wildlife Service Guidance on Site Assessment and Field Surveys for California Red-Legged Frog	
Appendix C. U.S. Fish and Wildlife Service Conservation Guidelines for the Valley Elderberry Longhorn Beetle	
Appendix D. Avian Species Observed within the Project, Area Battle Creek Salmon and Steelhead Restoration Project	
Appendix E. Common and Scientific Names for Plant Species Mentioned in the Text in the Battle Creek Salmon and Steelhead Restoration Project Area	
Appendix F. Common and Scientific Names for Wildlife Species Mentioned in the Text in the Battle Creek Salmon and Steelhead Restoration Project Area	

List of Tables and Figures

Table	Follows Page
2-1 Botanical Surveys and Wetland Delineation Dates	2-8
2-2 Special-Status Plants Documented or Identified as Potentially Occurring in the Battle Creek Salmon and Steelhead Restoration Project Area	2-8
2-3 Wildlife Survey Dates.....	2-8
2-4 Threatened, Endangered, Candidate, and Other Special-Status Wildlife Documented or Identified as Potentially Occurring in the Battle Creek Salmon and Steelhead Restoration Project Area.....	2-8
3-1 Plant Communities and Associated Wildlife Habitats Observed on the Project Sites (does not include existing access roads or potential staging areas)	3-30
3-2 Special-Status Plant Species Detected in the Battle Creek Salmon and Steelhead Restoration Project Area.....	3-30
3-3 Special-Status Wildlife Species Detected in the Battle Creek Salmon and Steelhead Restoration Project Area.....	3-30
4-1 Summary of Biological Resource Issues and Possible Mitigation Measures for the Battle Creek Salmon and Steelhead Restoration Project.....	4-2

Figure

1 Location of the Battle Creek Salmon and Steelhead Restoration Project	1-2
2 Battle Creek Salmon and Steelhead Restoration Project Sites	1-4

List of Acronyms

CALFED	CALFED Bay-Delta Program
CESA	California Endangered Species Act
cm	centimeter
CNFH	Coleman National Fish Hatchery
CN	California Native Plant Society
Corps	U.S. Army Corps of Engineers
CVPIA	Central Valley Project Improvement Act
dbh	diameter at breast height
DDT	dichlorodiphenyltrichloroethane
DFG	California Department of Fish and Game
dm	decimeter
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
ha	hectare
Hydroelectric Project	Battle Creek Hydroelectric Project
km	kilometer
mm	millimeter
NMFS	National Marine Fisheries Service
PG&E	Pacific Gas and Electric Company
USFWS	U.S. Fish and Wildlife Service

Chapter 1. Introduction

PROJECT OVERVIEW

Declining salmonid populations in the Sacramento River system have prompted habitat restoration actions throughout the watershed to preserve and enhance current populations. Battle Creek, a tributary to the Sacramento River, presents one such restoration opportunity through the Battle Creek Salmon and Steelhead Restoration Project (Restoration Project). This restoration effort is supported by directives from the following programs:

- the Central Valley Project Improvement Act's (CVPIA's) Anadromous Fish Restoration Program;
- the CALFED Bay-Delta Program's (CALFED's) California Bay-Delta Ecological Restoration Program;
- California's State Salmon, Steelhead Trout, and Anadromous Fisheries Program Act (California Senate Bill 2261, 1990);
- Central Valley Salmon and Steelhead Restoration and Enhancement Plan;
- the Upper Sacramento River Fisheries and Riparian Habitat Management Plan (California Senate Bill 1086, 1989);
- the National Marine Fisheries Service (NMFS) Proposed Recovery Plan for Sacramento River Winter-Run Chinook Salmon;
- Restoring Central Valley Streams—A Plan for Action; and
- the Steelhead Restoration Plan and Management Plan for California.

The Battle Creek watershed is on the volcanic slopes of Mt. Lassen in northern California in Shasta and Tehama Counties (Figure 1). Battle Creek stretches through remote, deep, shaded canyons and riparian corridors. The mountain stream is maintained by cold, spring-fed water with relatively high flows throughout the year. Before development in the watershed (described below), Battle Creek provided a contiguous stretch of prime habitat for anadromous chinook salmon and steelhead from its confluence with the Sacramento River upstream to natural barrier waterfalls. The decline of salmonid populations in the Sacramento River system in recent years has resulted in

increased restoration efforts throughout the watershed to preserve and enhance current populations while addressing the needs of various stakeholders.

The purpose of the Restoration Project is to restore and enhance approximately 42 miles of habitat in Battle Creek plus an additional 6 miles of habitat in its tributaries while minimizing the loss of clean and renewable energy produced by the Pacific Gas and Electric Company's (the Licensee's) Battle Creek Hydroelectric Project, Federal Energy Regulatory Commission (FERC) Project 1121 (Hydroelectric Project). Habitat restoration and enhancement in the Sacramento River and its tributaries would enable safe passage for and facilitate the growth and recovery of naturally produced salmonids, including

- Central Valley spring-run chinook salmon, state- and federally listed as threatened;
- Sacramento River winter-run chinook salmon, state- and federally listed as endangered; and
- Central Valley steelhead, federally listed as threatened.

The majority of this project would be accomplished through amendment of the FERC license for the Hydroelectric Project.

Fish habitat in Battle Creek has been affected primarily by the development of a privately owned hydroelectric project and a federal fish hatchery. The Hydroelectric Project was constructed within and adjacent to Battle Creek and its tributaries in the early 1900s. It consists of eight small diversion dams and more than 40 miles of canals to support five powerplants. The Hydroelectric Project has been owned and operated by the Licensee since 1919 and was licensed by FERC in 1976. The Coleman National Fish Hatchery (CNFH), downstream of the Hydroelectric Project, was constructed in the 1940s to mitigate impacts on anadromous fish that were associated with construction of Shasta Dam on the upper Sacramento River.

The Licensee is committed to work cooperatively to develop a cost-effective and equitable plan to address improvements for fish ladders, unscreened diversions, and inadequate streamflows for anadromous fishery habitat needs, including the removal and modification of some of its facilities. In June 1999, the U.S. Bureau of Reclamation entered into a Memorandum of Understanding with NMFS, the U.S. Fish and Wildlife Service (USFWS), the California Department of Fish and Game (DFG), and the Licensee to pursue a restoration plan for Battle Creek. Consequently, CALFED awarded \$28 million in directed funding to plan and implement the proposed Restoration Project. USFWS is also in the process of improving the CNFH intake structures and reevaluating its fish hatchery operations and has acquired CALFED funding to improve the CNFH seasonally operated fish barrier weir.

The proposed Restoration Project will involve restoration efforts at 11 sites along the North Fork and South Fork of Battle Creek (Figure 2). These sites include the following:

- North Battle Creek Feeder Diversion Dam,
- Eagle Canyon Diversion Dam,
- Wildcat Diversion Dam,
- Coleman Diversion Dam,
- Inskip Powerhouse,
- Penstock Junction Box,
- Lower Ripley Creek Feeder,
- Inskip Diversion Dam,
- South Powerhouse,
- Soap Creek Feeder, and
- South Diversion Dam.

Each site will be modified to restore and enhance fisheries habitat along Battle Creek. Based on the six alternatives in the Notice of Preparation for the proposed Restoration Project, the dam at each site would be either screened and laddered or removed. Hydropower facilities would be modified accordingly. A staging area and an access route to each project site (i.e., a new or existing road or trail) would be necessary to carry out construction activities.

For the purpose of this report, the following definitions will apply:

- The term *project site* refers to one of the sites listed above.
- The term *project area* refers to the project sites as a collective unit.
- The term *project region* refers to the area immediately surrounding and including the project area.
- The term *study area* refers to the area at each project site that was surveyed for biological resources and is outlined on aerial photographs in Volume II.

ORGANIZATION OF THIS REPORT

This report consists of two volumes. Volume I contains an executive summary, six chapters, and four appendices as described below.

- The Executive Summary discusses the presence of special-status species and sensitive plant communities in the project area.

- Chapter 1, “Introduction”, is an overview of the project and its location and the organization of the report.
- Chapter 2, “Study Objectives and Methods”, describes methods used to locate and document special-status species and classify plant communities in the project area.
- Chapter 3, “Study Results”, is a brief overview of the biological setting and results of the special-status species surveys.
- Chapter 4, “Constraints Analysis and Potential Mitigation Measures”, contains a table that summarizes potential impacts on biological resources and identifies potential mitigation measures.
- Chapter 5, “List of Preparers”, lists the individuals who conducted surveys and prepared this report.
- Chapter 6, “Citations”, lists the printed references and personal communications cited in the text.
- Appendix A is a memo from USFWS discussing endangered and threatened species in the Battle Creek Watershed.
- Appendix B presents USFWS guidelines on site assessments and field surveys for the California red-legged frog.
- Appendix C presents USFWS conservation guidelines for the valley elderberry longhorn beetle (VELB).
- Appendix D denotes avian species observed in the project area.
- Appendix E lists common and scientific names of plant species mentioned in this document.
- Appendix F lists common and scientific names of wildlife species mentioned in this document.

Volume II contains tables and maps of biological resources that were observed and identified during field surveys. Field survey results are documented in Volume II as described below.

- Waters of the United States (including wetlands) delineated in the project area are presented in Table II-1 and on maps D-1 through D-9.

- Botanical resources are presented in Table II-2 and on maps B-1 through B-9.
- Wildlife resources are presented in Table II-3 and on maps W-1 through W-9.

Biological resources are shown on aerial photographs for each project site except the Lower Ripley Creek Feeder, Soap Creek Feeder, and South Battle Creek Canal. Aerial photographs were not available for these sites; therefore, biological resources for these sites are shown on U.S. Geological Survey topographic maps.

Chapter 2. Study Methods

This chapter discusses the study methods used to document botanical, wetland, and wildlife resources in the project area. A detailed description of the methods used to delineate waters of the United States (including wetlands) is provided in a separate wetland delineation report (Jones & Stokes 2001).

BOTANICAL AND WETLAND STUDY METHODS

The areas studied for special-status wildlife varied at each project site and included a combination of diversion dams, flumes, pipelines, open canals, access roads, and staging areas. The study area for each project site was based on proposed construction methods, use of existing or new access roads, terrain constraints, private property boundaries, fence lines, and dense vegetation that would not be removed during construction. The project study areas are shown on the maps in Volume II of this report. Along existing access roads, the study area consisted of a 20-foot corridor on each side of the road edge (approximately 60 feet total).

Information reviewed to determine the location and types of vegetation resources that could exist in the project area included:

- DFG's Natural Diversity Data Base (CNDDDB) (2000),
- the California Native Plant Society's (CNPS's) 6th Edition Inventory of Rare and Endangered Vascular Plants of California (<http://www.cnps.org/rareplants/inventory/6thEdition.htm>. July 2000),
- available environmental documents,
- Jones & Stokes files, and
- relevant information from local planning documents.

When appropriate, state and federal resource specialists were contacted to obtain information on special-status plants, noxious weeds, and local ordinances (e.g., oak tree ordinances or policies).

Jones & Stokes botanists conducted a reconnaissance-level field visit on March 24 and 25, 2000, to evaluate existing conditions and determine the extent of required future botanical and wetland surveys. Botanical and wetland surveys were conducted at various times between April and August 2000 (Table 2-1). The overall objectives of the field surveys were to:

Table 2-1. Botanical Surveys and Wetland Delineation Dates

Project Area	Survey Dates	Survey Purpose
North Fork Battle Creek		
North Battle Creek Feeder Diversion Dam	April 13, 2000 August 4, 2000	Botanical Surveys and Wetland Delineation
Eagle Canyon Diversion Dam	April 20, 2000 May 26, 2000 March 19, 2001	Botanical Surveys and Wetland Delineation
Wildcat Diversion Dam	April 25, 2000 August 4 and 11, 2000 March 19, 2001	Botanical Surveys and Wetland Delineation
South Fork Battle Creek		
Coleman Diversion Dam/Inskip Powerhouse	April 4 and 5, 2000 June 15, 2000 August 11, 2000 March 20, 2001	Botanical Surveys and Wetland Delineation
Penstock Junction Box	April 4 and 5, 2000 August 11, 2000 March 20, 2001	Botanical Surveys and Wetland Delineation
Lower Ripley Creek Feeder	April 12, 2000 August 8, 2000	Botanical Surveys and Wetland Delineation
Inskip Diversion Dam/South Powerhouse	April 6, 2000 June 13 and 14, 2000 March 20, 2001	Botanical Surveys and Wetland Delineation
Soap Creek Feeder	April 12, 2000 August 8, 2000	Botanical Surveys and Wetland Delineation
South Diversion Dam	April 7 and 25, 2000 August 11, 2000 March 20, 2001	Botanical Surveys and Wetland Delineation
Access Roads		
Eagle Canyon Access Road	April 20, 2000 March 19, 2001	Botanical Surveys and Wetland Delineation
Wildcat Dam Access Road	April 13 and 25, 2000 August 4 and 11, 2000 March 19, 2001	Botanical Surveys and Wetland Delineation
Lower Ripley Creek Feeder Access Road	April 12 and 24, 2000 August 8, 2000 March 20, 2001	Botanical Surveys and Wetland Delineation

Project Area	Survey Dates	Survey Purpose
South Powerhouse Road to Inskip Diversion Dam/South Powerhouse Access Road	April 6 and 21, 2000 August 8, 2000 March 20, 2001	Botanical Surveys and Wetland Delineation
East of Bar Ranch and South Powerhouse Access Road	April 20, 2000 March 20, 2001	Botanical Surveys and Wetland Delineation
Bluff Springs to South Powerhouse Access Road	April 19, 2000 August 13 and 14, 2000 March 20, 2001	Botanical Surveys and Wetland Delineation
Soap Creek Feeder Access Road	April 12, 2000 August 8, 2000	Botanical Surveys and Wetland Delineation
South Diversion Dam Access Road	April 7, 14, and 25, 2000 August 11, 2000 March 20, 2001	Botanical Surveys and Wetland Delineation

- characterize plant communities and unique plant assemblages,
- identify special-status plant occurrences or suitable habitat for special-status plants,
- delineate waters of the United States (including wetlands) using the Corps' 1987 Wetland Delineation Manual (Environmental Laboratory 1987),
- map noxious weed infestations (see the definition below for species considered noxious weeds in this analysis),
- gather information to assist project engineers with project design, and
- coordinate with state and federal resource agencies to develop measures that avoid or minimize impacts on vegetation and wetland resources.

Special-Status Plant Surveys

Special-status plants are species legally protected under the California and federal Endangered Species Acts (ESAs) or other regulations and species considered sufficiently rare by the scientific community to qualify for such listing. Special-status plants are defined for the purpose of this biological survey summary report to include species in the following categories:

- species listed or proposed for listing as threatened or endangered under the federal ESA (50 CFR 17.12 for listed plants and various notices in the Federal Register for proposed species);
- candidates for possible future listing as threatened or endangered under the federal ESA (64 FR 57534, October 25, 1999);
- federal species of concern (former C2 candidates);
- species listed or proposed for listing by the State of California as threatened or endangered under the California ESA (14 CCR 670.5);
- species that meet the definition of rare or endangered under CEQA (State CEQA Guidelines, Section 15380);
- plants listed as rare under the California Native Plant Protection Act of 1977 (California Fish and Game Code, Section 1900 et seq.); and
- plants considered by CNPS to be “rare, threatened, or endangered in California” (Lists 1B and 2).

Information on occurrences of special-status plants in the project area was obtained initially from the CNDDDB (2000), USFWS (Appendix A), and reconnaissance-level surveys. Additional information on species' habitat requirements, blooming periods, and field identifying characteristics was obtained from state floras (Munz and Keck 1973, Hickman 1993) and the CNPS 5th (Skinner and Pavlik 1994) and 6th edition inventories. This information was used to develop a list of special-status plants that have the potential to occur in the Battle Creek region (Table 2-2). This table was used to identify habitats that have the highest potential to support special-status plants and to develop survey dates.

Floristic survey methods were used to locate special-status plants in the project area. Floristic survey methods followed DFG–recommended guidelines and involved identifying all species to the level necessary to determine whether they qualify as a special-status plant, or are plant species with unusual or significant range extensions. To account for different special-status plant identification periods, Jones & Stokes conducted several series of field surveys between April and August 2000 and March 2001 (refer to Table 2-1 for survey dates).

Depending on the terrain, various survey patterns were used, including meandering and intuitive controlled transects in areas that contained suitable habitat for special-status plants. Survey intensity varied depending on species richness, habitat type and quality, and the probability of special-status species occurring in a particular habitat type. In general, floristic field surveys included the following elements:

- Two series of field surveys were performed to identify early-blooming and late-blooming special-status plants. The number of surveys conducted in an area depended on elevation, habitat type, and the identification periods of plants that could occur in the habitat type.
- As required for floristic surveys, all plants encountered during field surveys were identified to the level necessary to determine whether they qualify as a special-status plant, or are plant species with unusual or significant range extensions. Plants were identified by use of floras (see Chapter 6, “Citations”) and visits to the California State University, Chico, herbaria. A list of vascular plant species identified during field surveys is on file at Jones & Stokes.
- Special-status plant populations in the project area were recorded on field forms. Data gathered for each occurrence included an estimate of the number of plants in the occurrence, a description of location and habitat conditions, phenological observations, and pertinent ecological information on each population.
- Special-status plant species in the project area were confirmed with voucher specimens. Voucher specimens were collected from populations of taxa when further taxonomic verification was necessary and when the population could withstand collection.

Table 2-2. Special-Status Plants Documented or Identified as Potentially Occurring in the Battle Creek Salmon and Steelhead Restoration Project Area

Common Name/ Scientific Name ¹	Legal Status ²			Distribution	Habitat Association	Occurrence in the Project Area	Period of Identification
	Federal	State	CNPS				
State and Federal Listed Plants							
Boggs Lake hedge-hyssop* <i>Gratiola heterosepala</i>	--	E	1B	Fresno, Lake, Lassen, Madera, Modoc, Placer, Sacramento, Shasta, San Joaquin, Solano, and Tehama Counties; also in Oregon	Shallow water, vernal pools, marshes, and lake margins (below 3,940 feet elevation)	None	April–June
Slender Orcutt grass* <i>Orcuttia tenuis</i>	T	E	1B	Lake, Lassen, Plumas, Sacramento, Shasta, Siskiyou, and Tehama Counties	Vernal pools (660–5,760 feet elevation)	None	May–July
CNPS List 2 and 1B Plants							
Dimorphic snapdragon <i>Antirrhinum subcordatum</i>	--	--	1B	Colusa, Glenn, Lake, and Tehama Counties	Chaparral, lower conifer forest, and sometimes on serpentine (980-2,600 feet elevation)	None	April–July
Big-Scale Balsamroot <i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>	--	--	1B	Alameda, Butte, Mariposa, Napa, Placer, Santa Clara, and Tehama Counties	Cismontane woodland, valley and foothill grassland, and sometimes serpentine (below 4,600 feet elevation)	None	March–June
Silky cryptantha* <i>Cryptantha crinita</i>	SC	--	1B	Shasta and Tehama Counties	Cismontane woodland, lower conifer forest, riparian forests, riparian woodland, and gravelly areas with valley foothill grasslands (490–990 feet elevation)	Known from several occurrences along the edge of Battle Creek; no populations documented during 2000 field surveys	April–May
Dwarf downingia <i>Downingia pusilla</i>	--	--	2	Merced, Mariposa, Napa, Placer, Sacramento, Solano, Sonora, Stanislaus, and Tehama Counties	Vernal pools and other seasonally wet places in valley and foothill annual grasslands (490 feet elevation)	None	March–May

Table 2-2. Continued

Common Name/ Scientific Name ¹	Legal Status ²			Distribution	Habitat Association	Occurrence in the Project Area	Period of Identification
	Federal	State	CNPS				
Four-angled spikerush <i>Eleocharis quadrangularis</i>	--	--	2	Butte, Merced, and Tehama Counties	Marshes and swamps with seasonally or permanently saturated soils (below 1600 feet elevation)	None	July–September
Brandegee’s Eriastrum <i>Eriastrum brandegeae</i>	SC	--	1B	Colusa, Glenn, Lake, Santa Clara, Tehama, and Trinity Counties	Chaparral, and cismontane woodland on volcanic soil (2,600–3,300 feet elevation)	None	May–August
Adobe-lily <i>Fritillaria puriflora</i>	SC	--	1B	Butte, Colusa, Glenn, Lake, Napa, Plumas, Solano, and Tehama Counties	Chaparral, cismontane woodland, and clayey foothill valley grasslands (below 1,640 feet elevation)	None	February–April
Red Bluff dwarf rush* <i>Juncus leiospermus</i> var. <i>leiospermus</i>	--	--	1B	Butte, Shasta, and Tehama Counties	Vernal pools and other seasonally wet sites in chaparral, oak woodland, and annual grassland (900–1,620 feet elevation)	None	March–May
Legenere <i>Legenere limosa</i>	SC	--	1B	Lake, Napa, Placer, Sacramento, San Mateo, Solano, Sonoma, Stanislaus, and Tehama Counties	Vernal pools (below 490 feet elevation)	None	May–June
Red-flowered lotus <i>Lotus rubriflorus</i>	SC	--	1B	Colusa, Stanislaus, and Tehama Counties	Cismontane woodland and foothill valley grassland (+/-660 feet elevation)	None	April–June
Ahart’s paronychia* <i>Paronychia ahartii</i>	SC	--	1B	Butte, Shasta, and Tehama Counties	Well-drained rocky outcrops, often vernal pool edges, volcanic uplands (below 1,650 feet elevation)	None	April–June
White-stemmed pondweed* <i>Potamogeton praelongus</i>	--	--	2	Lassen, Plumas, Shasta, and Sierra Counties; also in Washington and Oregon	Marshes and swamps with deep water (lakes) (5,900–9,800 feet elevation)	None	July–August
Eel-grass pondweed <i>Potamogeton zosteriformis</i>	--	--	2	Contra Costa, Lake, Lassen, Modoc, and Shasta Counties; also in Washington and Oregon	Marshes and swamps (below 4,300 feet elevation)	None	June–July

Table 2-2. Continued

Common Name/ Scientific Name ¹	Legal Status ²			Distribution	Habitat Association	Occurrence in the Project Area	Period of Identification
	Federal	State	CNPS				
Sanford's arrowhead <i>Sagittaria sanfordii</i>	SC	--	1B	Butte, Del Norte, Fresno, Kern, Merced, Marin, Orange, Sacramento, Shasta, San Joaquin, Tehama, and Ventura Counties	Slow-moving water often within saltwater and freshwater marshes (above 990 feet elevation)	None	May–August
Water bulrush <i>Scirpus subterminalis</i>	--	--	2	Butte, Plumas, Tehama, El Dorado, Del Norte, and Humboldt Counties; also in Oregon	Lake margins, ponds, and marshes (2,460–7,385 feet elevation)	None	July–August
Marsh skullcap <i>Scutellaria galericulata</i>	--	--	2	Plumas, Placer, Nevada, El Dorado, and Shasta Counties	Wet meadows, marshes, and streambanks in montane conifer forest (3,275–6,895 feet elevation)	None	June–September
Canyon Creek stonecrop <i>Sedum paradisum</i>	SC	--	1B	Shasta, and Trinity Counties	Broadleaved upland forest, chaparral, lower montane conifer forest, and subalpine conifer forest on granitic outcrops (980–4,600 feet elevation)	None	May–June
Obtuse Starwort* <i>Stellaria obtusa</i>	--	--	2	Butte, Glenn, Humboldt, and Tuolumne Counties; also in Idaho, Oregon, and Washington	Mesic areas in upper montane conifer forest (5,250–6,500 feet elevation)	None	July
Western compion <i>Silene occidentalis</i> ssp. <i>longistipitata</i>	--	--	1B	Butte, Plumas, Shasta, and Tehama Counties	Chaparral and lower montane conifer forest (3,280–6,565 feet elevation)	None	July–August
CNPS List 3 and 4 Plants							
Henderson's Bent Grass* <i>Agrostis hendersonii</i>	--	--	3	Butte, Calaveras, Merced, and Shasta Counties; also in Oregon	Valley and foothill grasslands and vernal pools (3000–3500 feet elevation)	None	April–May

Table 2-2. Continued

Common Name/ Scientific Name ¹	Legal Status ²			Distribution	Habitat Association	Occurrence in the Project Area	Period of Identification
	Federal	State	CNPS				
Sanborn's onion <i>Allium sanbornii</i> var. <i>sanbornii</i>	--	--	4	Butte, Calaveras, El Dorado, Nevada, Placer, Tehama, and Yuba Counties; also in Oregon	Gravelly areas on serpentinite substrates in chaparral, oak woodland, and lower montane coniferous forest (980–4,495 feet elevation)	None	May–September
Depauperate milk-vetch [†] <i>Astragalus pauperculus</i>	--	--	4	Butte, Placer, Shasta, Tehama, and Yuba Counties	Open, vernal moist, volcanic clay soils in oak woodland and annual grassland (490–1,970 feet elevation)	27 occurrences documented in the project area	March–May
Marsh claytonia <i>Claytonia palustris</i>	--	--	4	Butte, Fresno, Plumas, Siskiyou, Tehama, and Tulare Counties	Montane marshes, meadows, springs, and streambanks (3,280–8,205 feet elevation)	None	June–August
Hot rock daisy <i>Erigeron inornatus</i> var. <i>calidipetris</i>	--	--	4	Butte, Modoc, Plumas, Shasta, and Tehama Counties	Sandy, volcanic soils in lower montane conifer forest (3,600–4,600 feet elevation)	None	June–September
Butte County fritillary * <i>Fritillaria eastwoodiae</i>	--	--	3 ³	Butte, Shasta, Tehama, and Yuba Counties	Chaparral, cismontane woodland, and lower montane conifer forest (1,640–4,900 feet elevation)	32 occurrences of <i>Fritillaria</i> sp. identified during field surveys. High potential to be Butte County fritillary, which has been documented throughout the region	March–May
Woolly meadowfoam [†] <i>Limnanthes floccosa</i> ssp. <i>floccosa</i>	--	--	4	Butte, Lake, Shasta, Tehama, and Trinity Counties; also in Oregon	Vernal pools, moist meadows, and other seasonally wet habitats in oak woodland and valley and foothill annual grassland (33–1,320 feet elevation)	15 occurrences documented in the project area	March–June
Shield-bracted monkeyflower [†] <i>Mimulus glaucescens</i>	--	--	4	Butte, Colusa, Lake, and Tehama Counties	Seeps and other wet places in foothill woodland and foothill annual grassland (below 1,970 feet elevation)	15 occurrences documented in the project area	March–May

Common Name/ Scientific Name ¹	Legal Status ²			Distribution	Habitat Association	Occurrence in the Project Area	Period of Identification
	Federal	State	CNPS				
Bidwell's knotweed [†] <i>Polygonum bidwelliae</i>	--	--	4	Butte, Shasta, and Tehama Counties	Thin volcanic soils of openings in chaparral, oak woodland, and valley and foothill grasslands (195–3,940 feet elevation)	One occurrence documented in the project area	April–June
Pale yellow stonecrop <i>Sedum laxum</i> ssp. <i>flavidum</i>	--	--	4	Glenn, Humboldt, Shasta, Siskiyou, Tehama, and Trinity Counties	Serpentine or volcanic outcrops in broadleaved upland forest, chaparral, cismontane woodland, and lower montane conifer forest (2,600–6,500 feet elevation)	None	May–July

Notes:

- ¹ * = species identified in the NDDDB search (California Department of Fish and Game 2000).
[†] = species was located during spring and summer 2000 field surveys.

² Status explanation:**Federal**

- T = listed as threatened under the federal Endangered Species Act.
 SC = species of concern; species for which existing information indicates it may warrant listing but for which substantial biological information to support a proposed rule is lacking.
 -- = no listing.

State

- E = listed as endangered under the California Endangered Species Act.
 -- = no listing.

California Native Plant Society

- 1B = List 1B species: rare, threatened, or endangered in California and elsewhere.
 2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere.
 3 = List 3 species: plants about which more information is needed to determine their status.
 4 = List 4 species: plants of limited distribution.
 -- = no listing.

³ The *Fritillaria eastwoodiae* was recently listed as a CNPS List 3 species due to taxonomic problems; however, the *Fritillaria eastwoodiae* could possibly be relisted as a CNPS List 1B species.

- Special-status plant populations were mapped on aerial photographs (1 inch equals approximately 250 feet) and topographic maps. The aerial photographs and topographic maps are in a separately bound map volume accompanying this report (Volume II).

Plant Community Characterization and Mapping

Plant communities were mapped in the field for each project site on aerial photographs (1 inch equals approximately 250 feet). Descriptions and names of plant communities were based on field surveys and on descriptions in the list of California terrestrial natural communities recognized by the CNDDDB (2000), Holland (1986), and Sawyer and Keeler-Wolf (1995). Although the classification system of Sawyer and Keeler-Wolf represents the most recent treatment and includes greater community detail than the CNDDDB list, it is incomplete for many geographical areas in California. Additionally, some of the plant communities described in this report do not fit well into the communities that were defined by either Sawyer and Keeler-Wolf or Holland. Therefore, some community-type names have been modified based on field observations.

Noxious Weed Survey

Noxious weeds were documented as part of the floristic surveys. For the purpose of this analysis and field surveys, a noxious weed is a plant that has the potential to displace native plants and natural habitats, affect the quality of forage on rangelands, or affect cropland productivity. High-priority noxious weeds include all of the California Department of Food and Agriculture's "A" rated species. Some "B" and "C" rated species were included in this analysis if they were identified by the county agricultural commissions as target noxious weeds. Additional weeds were included if they were considered to have great potential for displacing native plants and damaging natural habitats and were not considered too widespread to be effectively controlled.

Noxious weed infestation and dispersal have been identified by federal, state, and county agencies as issues of concern and therefore are addressed in this report. Two federal acts and one executive order direct weed control: the Carlson-Foley Act of 1968, Federal Noxious Weed Act of 1974, and a federal executive order on invasive species (February 3, 1999). Local counties are also concerned about noxious weed infestation and dispersal on private and public lands. To identify noxious weed species of concern in the project region, the following sources were consulted:

- a list of species designated as federal noxious weeds by the U.S. Department of Agriculture;
- Shasta and Tehama Counties' Agricultural Commissioner;

- the California Department of Food and Agriculture’s “A”, “B”, and “C” lists of noxious weeds; and
- the California Exotic Pest Plant Council list of pest plants of ecological concern.

Delineation of Waters of the United States (Including Wetlands)

The term “waters of the United States” is an encompassing term used by the U.S. Army Corps of Engineers (Corps) to include areas that would qualify for federal regulation under Section 404 of the Clean Water Act. For the purpose of this document, waters of the United States are separated into wetlands and other waters of the United States.

Wetlands are defined as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3[b], 40 CFR 230.3). For a wetland to qualify as jurisdictional by the Corps and therefore be subject to regulation under Section 404 of the Clean Water Act, the site must support a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrology. Wetlands were identified in the field based on the Corps’ definition of waters of the United States. Wetlands were delineated using the methods outlined in the Corps 1987 Wetlands Delineation Manual.

Other waters of the United States are sites that typically lack one or more of the three indicators identified above. For the purpose of this document, drainages include all streams, creeks, rivers, and other surface features with defined beds and banks. The jurisdictional boundary for other waters of the United States was determined during the wetland delineation using the estimated ordinary high-water mark (based on an estimated 2-year flood event). Creeks and other types of drainage systems were the only type of other waters of the United States identified in the project area.

Waters of the United States (including wetlands) were mapped in the field for each project site on aerial photographs (1 inch equals approximately 250 feet). A detailed description of the methods used to delineate waters of the United States is provided in a separate wetland delineation report (Jones & Stokes 2001).

WILDLIFE STUDY METHODS

For the purpose of this report, the areas studied for special-status wildlife varied at each project site and included a combination of diversion dams, flumes, pipelines, open canals, access roads, and staging areas. The study area for each project site was based on proposed construction methods, use of existing or new access roads, terrain constraints, private property

boundaries, fence lines, and dense vegetation that would not be removed during construction. The study areas for each project site are shown on the maps presented in Volume II. Along existing access roads, the study area for VELB habitat surveys consisted of a 100-foot-wide corridor along both sides of the road (approximately 220 feet total). Raptor nest surveys included a 0.5-mile, line-of-sight corridor around all project sites and access roads.

Existing sources of information were reviewed to determine the location and types of wildlife resources that could exist in the project area. The sources of information included:

- DFG's CNDDDB (2000),
- Jones & Stokes file information,
- the Shasta and Tehama County Bird Lists (<http://web2.si.edu/smbc/listproj.htm>),
- California's Wildlife (Zeiner et al. 1988, 1990a, 1990b), and
- Dr. Hartwell Welsh (pers. comm.).

Jones & Stokes wildlife biologists conducted a reconnaissance-level field visit on March 24 and 25, 2000. The goals of this field visit were to evaluate existing conditions and determine the approximate locations and extent of required future wildlife surveys. Jones & Stokes surveyed for wildlife at various times between April and August 2000 (Table 2-3). The red-legged frog site assessment and VELB survey followed USFWS protocols (Appendices B and C, respectively). Jones & Stokes surveyed for tailed frog and other amphibians following methods developed by Dr. Hartwell Welsh of the Redwood Sciences Laboratory, U.S. Forest Service (Welsh pers. comm.). Wildlife surveys were conducted at various times between April and August 2000 (Table 2-3). The overall objectives of the field surveys were to:

- identify and describe wildlife habitat uses associated with plant communities,
- identify special-status wildlife occurrences and suitable habitats for special-status wildlife,
- gather information to assist project engineers with project design, and
- coordinate with state and federal resource agencies to develop measures that avoid or minimize impacts on special-status wildlife.

Special-Status Wildlife Surveys

Special-status wildlife are species legally protected under the California and federal ESAs or other regulations and species considered sufficiently rare by the scientific community to qualify for such listing. For the purpose of this report, the term "special-status wildlife" refers to species that are:

Table 2-3. Wildlife Survey Dates

Project Site	Survey Dates	Survey Purpose
North Fork Battle Creek		
North Battle Creek Feeder Diversion Dam	April 20, 2000 June 16, 2000	Raptor nest and bird surveys Breeding bird and spotted owl surveys
Eagle Canyon Diversion Dam	April 20, 2000 June 15, 2000 June 16, 2000 July 24, 2000	Raptor nest and bird surveys Bat survey Breeding bird survey VELB habitat survey
Wildcat Diversion Dam	April 20, 2000 June 16, 2000	Raptor nest and bird surveys Breeding bird survey
South Fork Battle Creek		
Coleman Diversion Dam/Inskip Powerhouse	April 17, 2000 June 13, 2000 July 25, 2000	Raptor nest and bird surveys Breeding bird survey VELB habitat survey
Penstock Junction Box	April 17, 2000 June 13, 2000	Raptor nest and bird surveys Breeding bird survey
Lower Ripley Creek Feeder	April 17, 2000 June 16, 2000 July 7, 2000 July 25, 2000 July 25, 2000	Raptor nest and bird surveys Breeding bird survey Willow flycatcher survey Willow flycatcher survey VELB habitat survey
Inskip Diversion Dam/South Powerhouse	April 17, 2000 June 13, 2000 June 14, 2000 July 24, 2000	Raptor nest and bird surveys Bat survey Breeding bird survey VELB habitat survey
Soap Creek Feeder	April 17, 2000 June 14, 2000 July 24, 2000	Raptor nest and bird surveys Breeding bird survey Tailed frog survey, general amphibian survey
South Diversion Dam	April 17, 2000 June 12, 2000 June 14, 2000 July 24, 2000	Raptor nest and bird surveys Bat survey Breeding bird survey Tailed frog survey, general amphibian survey
Access Roads		
Eagle Canyon Access Road	April 20, 2000 June 16, 2000	Raptor nest and bird surveys Breeding bird survey
Wildcat Dam Assess Road	April 20, 2000 June 16, 2000	Raptor nest and bird surveys Breeding bird survey
Lower Ripley Creek Feeder Access Road	April 17, 2000 June 14, 2000 July 24, 2000	Raptor nest and bird surveys Breeding bird survey VELB habitat survey

Project Site	Survey Dates	Survey Purpose
South Powerhouse Road to Inskip Dam/South Powerhouse Access Road	April 17, 2000 June 14, 2000	Raptor nest and bird surveys Breeding bird survey
East of Bar Ranch and South Powerhouse Access Road	April 17, 2000 June 14, 2000 July 24, 2000	Raptor nest and bird surveys Breeding bird survey VELB habitat survey
Bluff Springs to South Powerhouse Access Road	April 17, 2000 June 14, 2000 July 24, 2000	Raptor nest and bird surveys Breeding bird survey VELB habitat survey
Soap Creek Feeder Access Road	April 17, 2000 June 14, 2000 July 24, 2000	Raptor nest and bird surveys Breeding bird survey VELB habitat survey
South Diversion Dam Access Road	April 17, 2000 June 14, 2000	Raptor nest and bird surveys Breeding bird survey

- animals listed or proposed for listing as threatened or endangered under the federal ESA (50 CFR 17.11 [listed animals] and various notices in the Federal Register [proposed species]);
- animals that are candidates for possible future listing as threatened or endangered under the federal ESA (61 FR 40: 7596-7613, February 28, 1996);
- animal species of concern to USFWS;
- animals that meet the definitions of rare or endangered under CEQA (State CEQA Guidelines, Section 15380);
- animals listed or proposed for listing by the State of California as threatened or endangered under the California ESA (14 CCR 670.5);
- animals fully protected in California (California Fish and Game Code, Section 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]); and
- nesting raptors protected in California (California Fish and Game Code, Section 3503).

Information on occurrences of special-status wildlife in the project area was obtained initially from the CNDDDB (2000), USFWS (Appendix A), and reconnaissance-level surveys. This information was used to develop a list of special-status wildlife that have the potential to occur in the Battle Creek region (Table 2-4). This table was used to identify habitats that have the highest potential to support special-status wildlife and to ensure that surveys were conducted during the appropriate seasons.

Wildlife surveys were used to locate special-status wildlife and to identify sensitive habitats in the project area. To account for different seasonal occurrences of special-status wildlife, several series of field surveys were conducted between April and August 2000 and March 2001 (refer to Table 2-3 for a list of survey dates). Wildlife field surveys included the following elements:

- Two biologists performed two series of field surveys to identify early spring breeding birds and late spring/early summer breeding birds. The surveys consisted of visual and aural detections at all project sites and habitats and included a 100-meter buffer zone.
- With the exception of bats, biologists identified all vertebrates encountered during field surveys to the level necessary to determine whether they qualified as special-status species, unique occurrences, or extensions of species' documented ranges.
- Biologists visually surveyed for bats at dusk at each of the canal tunnel openings, but the species were not identified.

Table 2-4. Threatened, Endangered, Candidate, and Other Special-Status Wildlife Documented or Identified as Potentially Occurring in the Battle Creek Salmon and Steelhead Restoration Project Area

Common Name/ Scientific Name	Legal Status ¹		Distribution	Habitat Association	Occurrence in the Project Area
	Federal	State			
Insects					
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	FT, FS	--	Streamside habitats below 3,000 feet throughout the Central Valley	Riparian and oak savanna habitats with elderberry shrubs; elderberries are the host plant	No records from DFG's NDDB
Amphibians					
Tailed frog <i>Ascaphus truei</i>	SC	SSC, FP	Occurs in northwestern California from Del Norte County south to central Sonoma County and east as far as southwest Shasta County	Cool, perennial, swiftly flowing streams in redwood, Douglas-fir, and yellow pine forests; altered microclimate conditions from timber harvesting in riparian areas	No records from DFG's NDDB
California red-legged frog <i>Rana aurora draytoni</i>	FT	SSC	Along the coast and coastal mountain ranges of California from Marin County to San Diego County and in the Sierra Nevada from Tehama County to Fresno County	Permanent and semipermanent aquatic habitats, such as creeks and coldwater ponds, with emergent and submergent vegetation; may estivate in rodent burrows or cracks during dry periods	No records from DFG's NDDB
Foothill yellow-legged frog <i>Rana boylei</i>	SC, FS	SSC	In the Klamath, Cascade, north Coast, south Coast, Transverse, and Sierra Nevada Ranges up to approximately 6,000 feet elevation	Creeks or rivers in woodlands or forests with rock and gravel substrate and low overhanging vegetation along the edge; usually found near riffles with rocks and sunny banks nearby	No records from DFG's NDDB
Cascades frog <i>Rana cascadae</i>	SC, FS	SSC	In the Shasta-Trinity region east to the Modoc Plateau and south to the Lassen area and the upper Feather River system	Seasonal and permanent ponds and streams; oviposition habitat is open, shallow water in unshaded areas	No records from DFG's NDDB
Southern torrent (seep) salamander <i>Rhyacotriton variegatus</i> ('olympicus)	SC	SSC	Northwestern California forests in Del Norte, Humboldt, western Siskiyou, Trinity, and Mendocino Counties; disjunct population on Pit River Watershed in Shasta County	Seeps, springs, and high-gradient reaches of small forested streams; usually found in or adjacent to cool, shallow water beneath rocks or organic debris	No records from DFG's NDDB

Common Name/ Scientific Name	Legal Status ¹		Distribution	Habitat Association	Occurrence in the Project Area
	Federal	State			
Reptiles					
Northwestern pond turtle <i>Clemmys marmorata marmorata</i>	SC, FS	SSC	From the Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of the Sierra Nevada	Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests	No records from DFG's NDDB
Birds					
White-tailed kite <i>Elanus leucurus</i>	--	FP	Lowland areas west of the Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills, to western San Diego County	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands	No records from DFG's NDDB
Bald eagle <i>Haliaeetus leucocephalus</i>	FT, FS	SE	Nests in Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake, and Mendocino Counties and in the Lake Tahoe Basin; reintroduced into central coast; winter range includes the rest of California, except the southeastern deserts, very high altitudes in the Sierra Nevada, and east of the Sierra Nevada south of Mono County	In western North America, nests and roosts in coniferous forests within 1 mile of a lake, reservoir, stream, or the ocean	One record from DFG's NDDB
Osprey <i>Pandion haliaetus</i>	--	SSC	Nests along the north coast from Marin County to Del Norte County, east through the Klamath and Cascade Ranges, and in the upper Sacramento Valley; important inland breeding populations at Shasta Lake, Eagle Lake, and Lake Almanor and small numbers elsewhere south through the Sierra Nevada; winters along the coast from San Mateo County to San Diego County	Nests in snags, trees, or utility poles near the ocean, large lakes, or rivers with abundant fish populations	One record from DFG's NDDB
Sharp-shinned hawk <i>Accipiter striatus</i>	--	SSC	Permanent resident in the Sierra Nevada, Cascade, Klamath, and north Coast Ranges at midelevations and along the coast in Marin, San Francisco, San Mateo, Santa Cruz, and Monterey Counties; winters over the rest of the state except at very high elevations	Dense-canopy ponderosa pine or mixed-conifer forest and riparian habitats	No records from DFG's NDDB

Common Name/ Scientific Name	Legal Status ¹		Distribution	Habitat Association	Occurrence in the Project Area
	Federal	State			
Cooper's hawk <i>Accipiter cooperii</i>	--	SSC	Throughout California except high altitudes in the Sierra Nevada; winters in the Central Valley, southeastern desert regions, and plains east of the Cascade Range	Nests in a wide variety of habitat types, from riparian woodlands and digger pine-oak woodlands through mixed conifer forests	No records from DFG's NDDB
Northern goshawk <i>Accipiter gentilis</i>	SC, FS	SSC	Permanent resident in the Klamath and Cascade Ranges, in the north Coast Ranges from Del Norte County to Mendocino County, and in the Sierra Nevada south to Kern County; winters in Modoc, Lassen, Mono, and northern Inyo Counties	Nests and roosts in older stands of red fir, Jeffrey pine, ponderosa pine, lodgepole pine, Douglas-fir, and mixed conifer forests	One record from DFG's NDDB
Swainson's hawk <i>Buteo swainsoni</i>	--	ST	Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley; highest nesting densities occur near Davis and Woodland, Yolo County	Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields	No records from DFG's NDDB
Golden eagle <i>Aquila chrysaetos</i>	--	SSC, FP	Foothills and mountains throughout California; uncommon nonbreeding visitor to lowlands such as the Central Valley	Nest on cliffs and escarpments or in tall trees overlooking open country; forages in annual grasslands, chaparral, and oak woodlands with plentiful medium- and large-sized mammals	No records from DFG's NDDB
American peregrine falcon <i>Falco peregrinus anatum</i>	FE, FS	SE	Permanent resident along the north and south Coast Ranges; may summer in the Cascade and Klamath Ranges and through the Sierra Nevada to Madera County; winters in the Central Valley south through the Transverse and Peninsular Ranges and the plains east of the Cascade Range	Nests and roosts on protected ledges of high cliffs, usually adjacent to lakes, rivers, or marshes that support large prey populations	No records from DFG's NDDB
Prairie falcon <i>Falco mexicanus</i>	SC	SSC	Permanent resident in the south Coast, Transverse, Peninsular, and northern Cascade Ranges, the southeastern deserts, Inyo-White Mountains, foothills surrounding the Central Valley, and in the Sierra Nevada in Modoc, Lassen, and Plumas Counties; winters in the Central Valley, along the coast from Santa Barbara County to San Diego County, and in Marin, Sonoma, Humboldt, Del Norte, and Inyo Counties	Nests on cliffs or escarpments, usually overlooking dry, open terrain or uplands	No records from DFG's NDDB

Common Name/ Scientific Name	Legal Status ¹		Distribution	Habitat Association	Occurrence in the Project Area
	Federal	State			
Western burrowing owl <i>Athene cunicularia hypugea</i>	SC	SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas; rare along south coast	Level, open, dry, heavily grazed or low-stature grassland or desert vegetation with available burrows	No records from DFG's NDDB
California spotted owl <i>Strix occidentalis occidentalis</i>	SC, FS	SSC	Sierra Nevada from Lassen County south to northern Kern County, and in the Transverse, Peninsular, and southern coastal mountains	Mature forest with suitable nesting trees; in southern California, occurs in oak and oak-conifer habitats in addition to mature conifer forest	No records from DFG's NDDB
Long-eared owl <i>Asio otus</i>	--	SSC	Permanent resident east of the Cascade Range from Placer County north to the Oregon border, east of the Sierra Nevada from Alpine County to Inyo County; scattered breeding populations along the coast and in southeastern California; winters throughout the Central Valley and southeastern California	Nests in abandoned crow, hawk, or magpie nests, usually in dense riparian stands of willows, cottonwoods, live oaks, or conifers	No records from DFG's NDDB
Black swift <i>Cypseloides niger</i>	--	SSC	Breeds locally in the Sierra Nevada and Cascade Range, the San Gabriel, San Bernardino, and San Jacinto Mountains; and in coastal bluffs from San Mateo County south to near San Luis Obispo County	Nests in moist crevice or cave on sea cliffs above the surf, or on cliffs behind, or adjacent to, waterfalls in deep canyons	No records from DFG's NDDB
Vaux's swift <i>Chaetura vauxi</i>	--	SSC	Coastal belt from Del Norte County south to Santa Cruz County and in midelevation forests of the Sierra Nevada and Cascade Range	Nests in hollow, burned-out tree trunks in large conifers	No records from DFG's NDDB
Little willow flycatcher <i>Empidonax traillii brewsteri</i>	SC, FS	SE	Summers along the western Sierra Nevada from El Dorado to Madera County, in the Cascade and northern Sierra Nevada in Trinity, Shasta, Tehama, Butte, and Plumas Counties, and along the eastern Sierra Nevada from Lassen to Inyo County	Riparian areas and large wet meadows with abundant willows; usually found in riparian habitats during migration	No records from DFG's NDDB
Purple martin <i>Progne subis</i>	--	SSC	Coastal mountains south to San Luis Obispo County, west slope of the Sierra Nevada, and northern Sierra and Cascade ranges; absent from the Central Valley except in Sacramento; isolated, local populations in southern California	Nests in abandoned woodpecker holes in oaks, cottonwoods, and other deciduous trees in a variety of wooded and riparian habitats; also nests in vertical drainage holes under elevated freeways and highway bridges	No records from DFG's NDDB

Common Name/ Scientific Name	Legal Status ¹		Distribution	Habitat Association	Occurrence in the Project Area
	Federal	State			
Loggerhead shrike <i>Lanius ludovicianus</i>	SC	SSC	Resident and winter visitor in lowlands and foothills throughout California; rare on coastal slope north of Mendocino County, occurring only in winter	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches	No records from DFG's NDDB
California yellow warbler <i>Dendroica petechia brewsteri</i>	SC	SSC	Nests over all of California except the Central Valley, the Mojave Desert region, and high altitudes in the Sierra Nevada; winters along the Colorado River and in parts of Imperial and Riverside Counties	Nests in riparian areas dominated by willows, cottonwoods, sycamores, or alders or in mature chaparral; may also use oaks, conifers, and urban areas near stream courses	No records from DFG's NDDB
Yellow-breasted chat <i>Icteria virens</i>	--	SSC	Nests locally in coastal mountains and Sierra Nevada foothills, east of the Cascades in northern California, along the Colorado river, and very locally inland in southern California	Nests in dense riparian habitats dominated by willows, alders, Oregon ash, tall weeds, blackberry vines, and grapevines	No records from DFG's NDDB
Mammals					
Fringed myotis <i>Myotis thysanodes</i>	SC	--	Throughout California except the southeastern deserts and the Central Valley	Found in a wide variety of habitats from low desert scrub to high-elevation coniferous forests; day and night roosts in caves, mines trees, buildings, and rock crevices	No records from DFG's NDDB
Long-eared myotis <i>Myotis evotis</i>	SC	--	Throughout California except the southeastern deserts and the Central Valley	Occurs primarily in high-elevation coniferous forests, but also found in mixed hardwood/conifer, high desert, and humid coastal conifer habitats	No records from DFG's NDDB
Small-footed myotis <i>Myotis ciliolabrum</i>	SC	--	Sierra Nevada; south Coast, Transverse, and Peninsular Ranges; and the Great Basin	Open stands in forests and woodlands, as well as shrublands and desert scrub; uses caves, crevices, trees, and abandoned buildings	No records from DFG's NDDB
Long-legged myotis <i>Myotis volans</i>	SC	--	Mountains throughout California, including ranges in the Mojave Desert	Most common in woodlands and forests above 4,000 feet, but occurs from sea level to 11,000 feet	No records from DFG's NDDB
Yuma myotis <i>Myotis yumanensis</i>	SC	--	Common and widespread throughout most of California except the Colorado and Mojave Deserts	Found in a wide variety of habitats from sea level to 11,000 feet, but uncommon above 8,000 feet; optimal habitat is open forests and woodlands near water bodies	No records from DFG's NDDB

Common Name/ Scientific Name	Legal Status ¹		Distribution	Habitat Association	Occurrence in the Project Area
	Federal	State			
Pallid bat <i>Antrozous pallidus</i>	--	SSC	Throughout California, primarily at lower elevations and midelevations	Occurs in a variety of habitats from desert to coniferous forest; most closely associated with oak, yellow pine, redwood, and giant sequoia habitats in northern California; relies heavily on trees for roosts	No records from DFG's NDDB
Townsend's big-eared bat <i>Plecotus townsendii</i>	SC	SSC	Throughout California, from low desert to midelevation montane habitats	Roosts in caves, tunnels, mines, and dark attics of abandoned buildings; buildings must offer cavelike spaces to be suitable; highly sensitive to disturbance at roost sites	No records from DFG's NDDB
Sierra Nevada Mountain beaver <i>Aplodontia rufa</i>	--	SSC	Throughout the Klamath, Cascade, and Sierra Nevada mountains and the north Coast Ranges in Del Norte and Humboldt Counties; Sierra Nevada populations scattered and local	Slopes of ridges or gullies where there is abundant moisture, thick undergrowth, and soft soil for burrowing	No records from DFG's NDDB
Ringtail <i>Basariscus astutus</i>	--	FP	Little information on distribution and abundance; apparently occurs throughout the state except for the southern Central Valley and the Modoc Plateau	Occurs primarily in riparian habitats, but also known to occur in most forest and shrub habitats from lower elevations to midelevations	No records from DFG's NDDB
Pacific fisher <i>Martes pennanti pacifica</i>	SC, FS	SSC	Coastal mountains from Del Norte County to Sonoma County, east through the Cascades to Lassen County, and south in the Sierra Nevada to Kern County	Late-successional coniferous forests and montane riparian habitats	No records from DFG's NDDB
American badger <i>Taxidea taxus</i>	--	--	Statewide except for the northwestern corner in Del Norte County and parts of Humboldt and Siskiyou Counties	Typically found in open areas with scattered shrubs and trees; also found in open forests, particularly ponderosa pine	No records from DFG's NDDB

Notes:

¹ Status explanations:

Federal

FE = federally listed as endangered.
FS = USFS sensitive species.
FT = federally listed as threatened.
SC = species of concern.
-- = no listing.

State

FP = state fully protected.
SE = state listed as endangered.
SSC = species of special concern.
ST = state listed as threatened.
-- = no listing.

- Using high-powered spotting scopes and binoculars, biologists visually surveyed for raptor nests within 0.5 mile of project sites and access roads.
- Using USFWS protocols (Appendix B), biologists assessed the project area for red-legged frog habitat. Protocol-level surveys were not conducted because of the lack of suitable habitat as established in the reconnaissance-level surveys and the site assessments.
- Biologists conducted tailed frog surveys at two project sites with the highest potential for occurrence: Soap Creek Feeder and the South Diversion Dam. Survey methods followed methods developed by Dr. Hartwell Welsh, Redwood Sciences Laboratory, Pacific Southwest Research Station, U.S. Forest Service.
- Biologists conducted area-constrained surveys for other amphibian species following methods proposed by Welsh (1987).
- Elderberry bushes that provide habitat for the listed VELB were located in the project area and recorded in field notes. Data gathered for each occurrence followed USFWS protocols (Appendix C) and included searching for exit holes on living stems, counts of stems in three size classes, and a physical description of the location.
- Biologists surveyed for California spotted owls at potential habitat near the North Battle Creek Feeder Diversion Dam. Both visual and daytime calling surveys were conducted; however, USFWS protocol-level surveys for the California spotted owl were not performed. Protocol-level surveys, which require six separate field visits to each project site, are anticipated to be performed by Jones & Stokes biologists from April through August 2001.

VELB habitats and special-status wildlife occurrences were mapped on topographic maps. The topographic maps are provided in a separately bound map volume accompanying this report (Volume II, maps WL-1 through WL-9). Table II-3 in Volume II documents special-status wildlife species observed at the project sites.

Chapter 3. Study Results

This chapter includes an overview of the biological setting, general information on plant communities and associated wildlife habitat, and detailed information on each special-status species located during field surveys. This biological survey summary report does not provide detailed wetland delineation results; this information is available in the separate wetland delineation report that was prepared for the project (Jones & Stokes 2001).

PLANT COMMUNITIES AND ASSOCIATED WILDLIFE HABITATS

Table 3-1 summarizes the plant communities and associated wildlife habitats located at each of the project sites. Plant sizes are provided as they are referenced in botanical literature; some measurements are presented in metric units, while other measurements are presented in English units. All bird species observed at each site and a description of their seasonal status are listed in Appendix D.

Common Plant Communities and Associated Wildlife Habitats

Common plant communities are common in the project area and region, and include native or naturalized habitats that have not been substantially altered and that still provide habitat functions and values. Plant species and associated wildlife typically found in each common plant community are described in this section. The report lists species by common names. Scientific names for plant and wildlife species are provided in Appendices E and F, respectively. The following common plant communities are present within the project area and region:

- annual grassland,
- mixed chaparral,
- live oak woodland,
- blue oak woodland/savanna,
- gray pine/oak woodland, and
- westside ponderosa pine.

Annual Grassland

Annual grassland is the most common plant community in the project area. It occupies understory and open areas within the gray pine/oak woodland and blue oak woodland/savanna

Table 3-1. Plant Communities and Associated Wildlife Habitats Observed on the Project Sites^a

Project Site	Annual Grassland	Mixed Chaparral	Live Oak Woodland	Blue Oak Woodland/Savanna	Grey Pine/Oak Woodland	Westside Ponderosa Pine Forest	Emergent Wetland	Seasonal Wetland	Emergent Scrub Wetland	Groundwater Seep	Riparian Forest/Riparian Scrub
North Battle Creek Feeder Diversion Dam			X		X	X					X
Eagle Canyon Diversion Dam			X							X	X
Wildcat Diversion Dam/Wildcat Pipeline	X	X		X							X
Coleman Diversion Dam/Inskip Powerhouse ^b	X		X	X	X		X	X	X		X
Lower Ripley Creek Feeder	X			X							X
Inskip Diversion Dam/South Powerhouse	X		X				X	X			X
Soap Creek Feeder	X	X	X	X	X						X
South Diversion Dam/South Battle Creek Canal		X			X						X

Notes:

^a This table does not include plant communities and associated wildlife habitats observed in existing access roads or potential staging areas.

^b The Coleman Diversion Dam/Inskip Powerhouse project site also includes plant community and associated wildlife habitat observations at the Penstock Junction Box.

communities. Annual grassland is dominated by mostly non-native annual grass species, including soft chess, red brome, ripgut brome, medusa head, annual fescues, silver hairgrass, wild oat, lesser quaking-grass, and Italian rye-grass. Common native herbaceous species include tidy-tips, goldfields, yellowcarpet, popcorn-flowers, lowland shooting star, saxifrage, erect plantain, dwarf stonecrop, Fitch's spikeweed, filago, tarweeds, q-tips, marigold navarretia, downy navarretia, vetch, cowbag clover, tomcat clover, and white-tipped clover. Native perennial species include some of those mentioned under the blue oak woodland/savanna description. Other non-native weedy species include filarees, star-thistle, and prickly lettuce.

Raptors that were observed foraging in grasslands of the study area during spring and summer include red-tailed hawk, American kestrel, and barn owl. Western kingbird and loggerhead shrike perch on fence posts and search for prey in grassland habitats. Ground-foraging birds in grassland habitats include American crow, horned lark, American pipit, vesper sparrow, lark sparrow, savanna sparrow, western meadowlark, Brewer's blackbird, brown-headed cowbird, and house finch. Several species of swallows forage on the wing for flying insects. Additional species that probably winter in the study area include various special-status raptors such as white-tailed kite, northern harrier, ferruginous hawk, rough-legged hawk, golden eagle, prairie falcon, and merlin.

Representative reptiles and mammals of annual grasslands include gopher snake, western rattlesnake (mostly near rock outcrops), garter snakes, western fence lizard, coyotes, black-tailed deer, and California ground squirrel.

Mixed Chaparral

Mixed chaparral is common throughout the project area, but typically is found in openings of other community types after fires have removed overstory trees and on north facing slopes in canyons. This community is dominated by broad-leaved sclerophyll shrubs, typically 3 to 5 meters tall, forming a dense overstory. Common shrubs include buckbrush, big manzanita, green-leaved manzanita, birch-leaved mountain-mahogany, coffeeberry, poison oak, California yerba-santa, and California buckeye.

Overstory trees typically are lacking except in the transition zone between community types, where canyon live oak and interior live oak are present, but scattered.

Resident bird species observed within chaparral habitats of the study area include mountain quail, California quail, mourning dove, Anna's hummingbird, and foliage-gleaning birds such as western scrub-jay, oak titmouse, bushtit, Bewick's wren, blue-gray gnatcatcher, wrentit, California thrasher, spotted towhee, California towhee, and rufous-crowned sparrow. Lesser goldfinch is an important seed-eating bird in this habitat and is joined by wintering species that include fox sparrow, golden-crowned sparrow, white-crowned sparrow, dark-eyed junco, and hermit thrush. Neotropical migrants in spring include western tanager, black-headed grosbeak, orange-crowned warbler, and lazuli bunting. The latter two species are common nesters in chaparral habitats.

Representative reptiles and mammals in mixed chaparral habitats include gopher snake, western rattlesnake, western fence lizard, black-tailed deer, and gray fox.

Live Oak Woodland

Live oak woodland is common in the project area, typically occurring in canyons and valley bottoms near streams. This plant community forms a mosaic in the transition zones between gray pine/oak woodland and chaparral on north facing slopes.

Live oak woodland is dominated by a mixture of canyon live oak and interior live oak. The overstory typically is dense, and other trees such as California bay laurel, buckeye, and black oak are usually present, but are a minor component of the overstory. The understory typically is poorly developed or lacking in areas with dense overstory, but poison oak, pipevine, California melic grass, Pacific sanicle, and sword fern are common in open areas.

Representative nesting raptors of live oak woodland habitats include red-tailed hawk, American kestrel, barn owl, great horned owl, western screech-owl and northern pygmy-owl. Ground-foraging birds include California quail, mourning dove, spotted towhee, California towhee, lark sparrow and dark-eyed junco. Anna's hummingbird feed on the many flowers and their associated insects. Trunk-dwelling species include acorn woodpecker, Nuttall's woodpecker, northern flicker and white-breasted nuthatch. Neotropical migrants, such as Pacific-slope flycatcher, ash-throated flycatcher, house wren, blue-gray gnatcatcher, orange-crowned warbler, black-throated gray warbler, Bullock's oriole, and lazuli bunting, join the following resident insectivores in gleaning insects off leaves of trees and shrubs: Hutton's vireo, western scrub-jay, oak titmouse, bushtit, Bewick's wren, western bluebird, American robin, and California thrasher. Important seed-eaters include brown-headed cowbird, house finch and lesser goldfinch. Phainopepla associates primarily with mistletoe in the oaks. Additional wintering and migrating birds include white-crowned and golden-crowned sparrows.

Representative reptiles and mammals in live oak woodlands include western rattlesnake, northern alligator lizard, deer mouse, striped skunk, ringtail, bobcat, black-tailed deer, raccoon, and western gray squirrel.

Blue Oak Woodland/Savanna

Blue oak woodland/savanna is located in the project area on sites with relatively thin, rocky soils. The community intergrades with gray pine/oak woodland at higher elevations and is replaced by annual grassland in thinner soils and at lower elevations.

Blue oak woodland/savanna is characterized by a relatively open tree canopy dominated almost entirely by blue oaks. Shrubs are mostly lacking but may include scattered individuals or occasional aggregations of mixed chaparral species. Herbaceous species commonly found in the openings include blue dicks, grass nuts, soaproot, western buttercup, sanicle, manroot, bedstraws, puttyroot, and miner's lettuce. Most annual species are the same as those described for the annual grassland plant community (see above).

Representative raptors include red-tailed hawk, American kestrel, barn owl, great horned owl, and western screech owl. California quail and mourning dove forage on the ground for seed, and the greater roadrunner hunts for lizards and snakes. Trunk-dwelling birds include acorn woodpecker, Nuttall's woodpecker, northern flicker, and white-breasted nuthatch. Neotropical migrants, such as ash-throated flycatcher, blue-gray gnatcatcher, orange-crowned warbler, and Bullock's oriole, join the following resident insectivores in gleaning insects off leaves of trees and shrubs: Hutton's vireo, western scrub jay, oak titmouse, bushtit, Bewick's wren, western bluebird, and lark sparrow. Phainopepla associates primarily with mistletoe in the oaks. Important seed-eaters include brown-headed cowbird, California towhee, house finch and lesser goldfinch, and the wintering white-crowned and golden-crowned sparrows.

Representative reptiles and mammals in blue oak woodlands and savannas include gopher snake, western fence lizard, California ground squirrel, coyote, and striped skunk.

Gray Pine/Oak Woodland

Gray pine/oak woodland is common in the project area where it transitions into westside ponderosa pine forest at higher elevations and blue oak woodland and annual grassland at lower elevations. Mixed chaparral is found in inclusions and forms the shrubby understory component in places.

Gray pine/oak woodland is dominated by a varying mixture of blue oak and gray pine. At higher elevations, scattered black oak, bigleaf maple, and California bay are also present. Associated shrub and subshrub species include many that are common to mixed chaparral, including toyon, manzanita, coffeeberry, redberry, California buckeye, redbud, buckbrush, mountain mahogany, poison oak, lemonadeberry, bedstraws, and live oaks.

Herbaceous species are mostly lacking where the shrub layer is best developed. In open areas, herbaceous species include many that are common to the adjacent blue oak woodland/savanna and annual grassland plant communities.

Representative wildlife species include the species representative of live oak woodland habitats (see above).

Westside Ponderosa Pine Forest

Westside ponderosa pine forest occupies the upper elevations along access roads to the southern end of the project area. Westside ponderosa pine forest also intergrades with gray pine/oak woodland and mixed chaparral at lower elevations.

Westside ponderosa pine forest is dominated by a relatively dense-to-open canopy of ponderosa pine, with scattered incense cedar, black oak, and canyon live oak. Also present at lower elevations are occasional California bay and gray pine. Shrub and subshrub species include

mountain lilac, manzanita and live oaks. At lower elevations, coffeeberry, redbud, blackberry, and poison oak are found.

Common herbaceous species include wild iris, snub pea, Indian pink, aster, goldenrod, bracken fern, and woodland strawberry. Grasses include mountain brome, orchard grass, needlegrass, hedgehog dogtail, nitgrass, and annual fescues. Other species common to the annual grassland reach their higher elevation limits here.

Representative raptors include sharp-shinned hawk, red-tailed hawk, western screech owl, great horned owl and northern pygmy-owl. Band-tailed pigeons forage primarily on acorns. Trunk-dwelling birds include red-breasted sapsucker, hairy woodpecker, northern flicker, pileated woodpecker, red-breasted nuthatch, and white-breasted nuthatch. Neotropical migrants, such as olive-sided flycatcher, western wood-pewee, Pacific-slope flycatcher, Cassin's vireo, warbling vireo, Nashville warbler, black-throated gray warbler, hermit warbler, Wilson's warbler, western tanager, black-headed grosbeak, lazuli bunting, and chipping sparrow, join the following resident insectivores in gleaning insects off leaves of trees and shrubs: Hutton's vireo, Steller's jay, western scrub-jay, oak titmouse, bushtit, brown creeper, winter wren, golden-crowned kinglet, American robin, spotted towhee, and dark-eyed junco. Important seed-eating species include mountain quail, brown-headed cowbird, purple finch, pine siskin, and lesser goldfinch. Violet-green swallow forage for insects on the wing over forests and creeks.

Representative reptiles and mammals of ponderosa pine forests include ring-necked snake, common kingsnake, California slender salamander, deer mouse, western gray squirrel, striped skunk, raccoon, and bobcat.

Sensitive Plant Communities and Associated Wildlife Habitats

For the purpose of this report, sensitive communities are those communities that are especially diverse, regionally uncommon, considered sensitive natural communities (as defined by Holland 1986), or regulated by federal or state agencies. Most sensitive plant communities are given special consideration because they provide important ecological functions. Some plant communities support a unique or diverse assemblage of plant species and therefore are considered sensitive from a botanical standpoint.

Plant species and associated wildlife typically found in each sensitive plant community are described in this section. This report lists species by common names. Scientific names for plant and wildlife species are provided in Appendices E and F, respectively.

The following sensitive plant communities are present in the project area:

- emergent wetland,
- seasonal wetland,
- emergent scrub wetland,
- groundwater seep wetland, and

- riparian forest and scrub.

Four of the five sensitive plant communities within the project area are wetland communities. Wetlands are significant natural communities that deserve special consideration because of historical and current regional and statewide losses and because of the federal laws and policies that pertain to their protection. Wetland communities in the project area play a role in groundwater discharge to support stream baseflow, capturing sediment and nutrient runoff, and providing habitat for dependent wildlife and plant species.

The locations of sensitive plant communities documented during field surveys are shown on maps in Volume II (Maps D-1 through D-9). Each occurrence is also recorded in Table II-1 in Volume II of this report. Sensitive plant communities, including those that qualify as waters of the United States, are described briefly below.

Emergent Wetland

Jones & Stokes delineated 3.13 acres of emergent wetlands on the project sites (see Table II-1 in Volume II of this report for a list of individual wetland sites). Emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes. These wetlands are usually dominated by perennial plants present for most of the growing season in most years. Dominant species include narrow-leaved cattail, rush, Parish's spike-rush, monkeyflower, and Himalaya blackberry.

On the project sites, emergent wetlands were delineated as Corps jurisdictional wetlands because they are characterized by a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrologic conditions.

Representative water birds that forage and rest in emergent wetlands and associated open water habitats in the Sierra Nevada foothills include pied-billed grebe, great blue heron, and great egret. Various ducks, including wood duck, green-winged teal, mallard, cinnamon teal, gadwall, American wigeon, and ring-necked duck frequent emergent wetlands where they are joined by American coot, killdeer, black-necked stilt, greater yellowlegs, and common snipe. Typical amphibians and reptiles in these habitats are California newt, foothill yellow-legged frog, northwestern pond turtle, and garter snakes. Many of the larger mammals such as black-tailed deer may frequent emergent wetlands and use them as a source of drinking water.

Seasonal Wetland

Jones & Stokes delineated 1.01 acres of seasonal wetlands on the project sites and along access roads (see Table II-1 in Volume II of this report for a list of individual wetland sites). Seasonal wetlands are characterized by short-duration ponding that is sufficient to support hydrophytic plant species. These areas are different from vernal pools in various respects but are distinguished from them by the lack of specialized vernal pool plant species.

Seasonal wetlands in the project area are dominated by Italian rye-grass, curly dock, cocklebur, annual hairgrass, Mediterranean barley, long-beaked hawkbit, hyssop loosestrife, toad rush, and occasional vernal pool species such as coyote thistle, Fremont's goldfields, woolly marbles, and water starwort.

On the project sites, seasonal wetlands were delineated as Corps jurisdictional wetlands because they are characterized by a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrologic conditions.

Because of their isolation and limited extent in the study area, seasonal wetlands receive limited use by most species of wildlife. Where standing water is present, however, seasonal wetlands can attract the same wetland-dependent birds and other wildlife that frequent emergent wetlands.

Emergent Scrub Wetland

Jones & Stokes delineated 1.57 acres of emergent scrub wetlands on the project sites (see Table II-1 in Volume II of this report for a list of individual wetland sites). Emergent scrub wetlands are characterized by the same erect, rooted, herbaceous hydrophytes described above under emergent wetlands. In addition, these wetlands are dominated by broad-leaved deciduous hydrophytes, usually less than 6 meters tall, such as willows and white alder. These wetlands may represent a successional stage leading to forested wetlands, or they may be relatively stable communities.

On the project sites, emergent scrub wetlands were delineated as Corps jurisdictional wetlands because they are characterized by a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrologic conditions.

Representative wildlife species are similar to those species described for emergent and seasonal wetlands above.

Groundwater Seep Wetland

Jones & Stokes delineated 0.827 acre of groundwater seep wetlands on the project sites (see Table II-1 in Volume II of this report for a list of individual wetland sites). Groundwater seep wetlands are dominated by annual or perennial hydrophytes. The substrate is usually saturated to the surface for extended periods, especially early in the growing season, but can be absent by the end of the season in most years. Dominant species include watercress, monkeyflower, various sedges, and liverworts.

On the project sites, groundwater seeps were delineated as Corps jurisdictional wetlands because they are characterized by a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrologic conditions.

Representative wildlife species are similar to those species described for other wetland habitats above.

Riparian Forest and Scrub

Riparian forest and scrub communities occur along perennial drainages in the project area (i.e., North and South Forks of Battle Creek, Ripley Creek, Soap Creek), along several unnamed drainages, and in several emergent wetlands (see Table II-1 in Volume II of this report for a list of individual drainages that support riparian forest and scrub). Riparian scrub dominates areas along channels in most creeks and forms a mosaic with riparian forest or live oak woodland.

In areas with broader floodplains, riparian trees such as valley oak and western sycamore tend to dominate the overstory. The understory in these areas is usually covered by patches of Himalaya blackberry, scattered willows, and California wild grape.

In canyons with perennial streams (such as North Battle Creek), the following species are common in addition to the species listed above. Overstory species include California bay, alder, big-leaf maple, fig, white mulberry, Douglas-fir, Pacific yew, and Oregon ash. Understory shrubs include poison oak, western spicebush, dogwood, and several species of willow.

In the project area, riparian communities generally are dominated by hydrophytic vegetation and hydrologic conditions, but lack hydric soil indicators. Riparian communities that occur within the ordinary high-water mark of Battle Creek and other drainages would be considered other waters of the United States, subject to regulation by the Corps under Section 404 of the Clean Water Act.

Riparian scrub habitats are among the most important wildlife habitats in the study area. These habitats attract a high diversity of resident and neotropical migratory birds including the fish-eating belted kingfisher; the trunk-dwelling downy woodpecker; the flycatching black phoebe; and the foliage-gleaning warbling vireo, western scrub-jay, bushtit, Bewick's wren, house wren, American robin, orange-crowned warbler, yellow-breasted chat, western tanager, black-headed grosbeak, lazuli bunting, spotted towhee, and song sparrow. Important seed-eating species include house finch and lesser goldfinch.

Other representative wildlife species in riparian habitats of the study area include most mammals, amphibians, and reptiles that are attracted to a source of flowing water. Riparian corridors are important deer migratory habitat. Bats frequently forage for insects over riparian areas in the canyons, and many individuals roost in the abandoned tunnels such as those near the South Diversion Dam and the Eagle Canyon Dam. The number of bat species using the study area was not determined during the field surveys, but fringed myotis, long-eared myotis, small-footed myotis, long-legged myotis, Yuma myotis, pallid bat, and Townsend's big-eared bat could potentially occur there, and all are considered species of concern by USFWS (see Special-Status Wildlife, below).

NOXIOUS WEEDS

Five noxious weed species were located at several project sites during the field surveys, including medusa head, yellow star-thistle, Klamath weed, Scotch broom, and Chinese tree-of-heaven. Medusa head, yellow star-thistle, and Klamath weed are common in the project region and are considered ubiquitous in California. These species are no longer targeted for eradication and control. However, the Battle Creek Watershed Conservancy Noxious Weeds Removal Program does have measures for removal and control of these species (Paquin-Gilmore pers. comm.).

Scotch broom is a “C” list species on the California Department of Food and Agriculture list of noxious weeds. Such species are so widespread that the agency generally does not endorse state- or county-funded eradication or containment efforts except in nurseries or seed lots. Chinese tree-of-heaven is not considered a noxious weed but is a highly invasive horticultural species that displaces native riparian species. Chinese tree-of-heaven was identified on the Wildcat Diversion Dam site, and Scotch broom was located at the Coleman Diversion Dam/Inskip Powerhouse and Inskip Diversion Dam/South Powerhouse sites.

SPECIAL-STATUS PLANTS

Thirty-one special-status plants were identified during the pre-field survey investigation as having the potential to occur in the project area (Table 2-2). No state- or federally listed plant species were previously documented on the project sites, and none were located during the field surveys. However, four species that are considered plants of limited distribution by CNPS (List 4 plants) (Table 3-2) were located on the project sites during field surveys, including:

- woolly meadowfoam (*Limnanthes flocossa* ssp. *flocossa*),
- depauperate milk-vetch (*Astragalus pauperculus*),
- shield-bracted monkeyflower (*Mimulus glaucescens*), and
- Bidwell’s knotweed (*Polygonum bidwelliae*).

Because many CNPS List 4 plants can be significant locally, the plants listed above were evaluated in this report to determine whether they warranted treatment as special-status species. The following criteria were used to determine if these CNPS-listed plants should be considered special-status species:

- type locality of species,
- extension of species’ known range,
- locally uncommon or threatened species, and
- unusual morphology or other habitat characteristics exhibited by a population.

After considering available distribution information and reviewing file information, it was determined that none of the four CNPS List 4 plants meet the four criteria listed above and therefore

Table 3-2. Special-Status Plant Species Detected in the Battle Creek Salmon and Steelhead Restoration Project Area

California Native Plant Society Listed Species		
Common Name	Scientific Name	Legal Status
Depauperate milk-vetch	<i>Astragalus pauperculus</i>	CNPS List 4
Woolly meadowfoam	<i>Limnanthes floccosa</i> ssp. <i>floccosa</i>	CNPS List 4
Shield-bracted monkeyflower	<i>Mimulus glaucescens</i>	CNPS List 4
Bidwell's knotweed	<i>Polygonum bidwelliae</i>	CNPS List 4

Note:

CNPS = California Native Plant Society.

do not warrant evaluation as special-status plants. These CNPS List 4 plants lack special significance in the project area and do not appear to be threatened.

In addition to these CNPS List 4 plants, several fritillary (*Fritillaria* sp.) populations were located during the 2000 field surveys. The 2000 surveys were initiated in mid-April, past the flowering period for most fritillary species and, therefore, the species could not be confirmed at that time. Because the DFG CNDDDB contains several occurrences of Butte County fritillary near the project area (California Natural Diversity Database 2000), Jones & Stokes revisited the fritillary populations on March 19 and 20, 2001. The fritillary populations were determined to be *Fritillaria affinis* and *Fritillaria recurra*. These species are both locally and regionally common.

The locations of the CNPS List 4 species documented during field surveys are shown on maps in Volume II (Maps B-1 through B-9). Each occurrence is also recorded in Table II-2 in Volume II of this report. Each species is briefly described below.

Woolly Meadowfoam

Woolly meadowfoam is a white-flowered annual in the meadowfoam family. The plants are 15 to 20 centimeters (cm) tall, with leaves that are less than 8.0 cm long and divided into four to ten linear leaflets. The bell- to urn-shaped flowers are 4.5 to 8.5 millimeters (mm) long and appear between March and June (Hickman 1993).

Status and Distribution

Woolly meadowfoam is considered by CNPS as a plant of limited distribution in California (a watch list species), qualifying it for List 4. It is known in California from Butte, Lake, Shasta, Siskiyou, Tehama, and Trinity Counties and in Oregon (Skinner and Pavlik 1994). The species occurs in elevations of approximately 30 to 1,320 feet (Hickman 1993).

Habitat Association

Woolly meadowfoam grows in moist meadows, vernal pools, and other vernal mesic places in oak woodland and annual grassland communities (Skinner and Pavlik 1994). The species is common in disturbed areas in the foothills of Tehama County.

Occurrence in the Project Area

A total of 15 occurrences of woolly meadowfoam were located on three of the project sites during field surveys. The occurrence sizes vary from a few to several thousand plants. In the project area, woolly meadowfoam populations typically occur in low-lying areas that have been previously disturbed (e.g., along access roads, pipelines, and other facilities). Woolly meadowfoam

was documented at the following project sites: Wildcat Diversion Dam and its associated access road; Coleman Diversion Dam/Inskip Powerhouse; and Lower Ripley Creek Feeder and its associated access road. Information on each woolly meadowfoam occurrence is in Table II-2 in Volume II.

Depauperate Milk-Vetch

Depauperate milk-vetch is a small delicate member of the pea family. The plants are annuals, less than 1 decimeter (dm) in height with purple flowers. Its leaves are 1.5 to 5 cm long with 5 to 11 well-separated leaflets. The fruits are crescent-shaped, 12 to 20 mm long, about 3 mm wide, and often purple-mottled with a short beak (Hickman 1993). Depauperate milk-vetch flowers between March and May.

Status and Distribution

Depauperate milk-vetch is considered by CNPS as a plant of limited distribution in California (a watch list species), qualifying it for List 4. It is endemic to California, and is known from Butte, Placer, Shasta, Tehama, and Yuba Counties, where it is found at elevations ranging from 490 to 1,970 feet (Hickman 1993).

Habitat Association

Depauperate milk-vetch grows in open, vernal-moist volcanic clay soils in valley and foothill grasslands and cismontane woodlands (Skinner and Pavlik 1994).

Occurrence in the Project Area

Twenty-seven occurrences of depauperate milk-vetch were located on the following six project sites during field surveys: South Diversion Dam and access road; Inskip Diversion Dam/South Power House; Inskip Diversion Dam and access road; South Powerhouse and access road from Bluff Springs; Soap Creek feeder and access road; and along the South Battle Creek Canal. The depauperate milk-vetch population sizes ranged from a few scattered individuals to several hundred individuals. In the project area, depauperate milk-vetch plants generally occur in annual grasslands on volcanic substrates. Information on each depauperate milk-vetch occurrence is in Table II-2 in Volume II.

Shield-Bracted Monkeyflower

Shield-bracted monkeyflower is a yellow-flowered annual in the figwort family. The plants are typically 6 to 80 cm tall and have ovate to round leaves with blades 5 to 70 mm; they have bracts that are fused around the stem completely, forming circular disks 5 to 45 mm wide. The flowers are 7 to 25 mm long, have unequal lobes, and appear from March to May (Hickman 1993).

Status and Distribution

Shield-bracted monkeyflower is considered by CNPS as a plant of limited distribution in California (a watch list species), qualifying it for List 4. It is endemic to California, and is known from Butte, Colusa, Lake, and Tehama Counties, where it is found below 1,970 feet elevation (Skinner and Pavlik 1994).

Habitat Association

Shield-bracted monkeyflower grows in cismontane woodland and valley and foothill grassland on serpentine seeps and other wet areas (Skinner and Pavlik 1994).

Occurrence in the Project Area

Twenty occurrences of shield-bracted monkeyflower were found at four of the project sites, including the Coleman Diversion Dam/Inskip Powerhouse, Inskip Diversion Dam, South Battle Creek Canal, and South Diversion Dam and its associated access road. In the project area, shield-bracted monkeyflower plants were found in seasonally moist habitats, typically seasonal wetland communities. The population sizes ranged from 25 individual plants to several thousands plants. Information on each shield-bracted monkeyflower occurrence is in Table II-2 in Volume II.

Bidwell's Knotweed

Bidwell's knotweed is a small pink-flowered annual herb in the buckwheat family. The plants typically are 2 to 20 cm tall and have 4 to 8 mm leaves crowded at the top of the plant. The stems have silvery stipules, which can obscure the leaves and flowers. The flowers are about 2.5 mm long, are located in the upper axils, and appear from April to June (Hickman 1993).

Status and Distribution

Bidwell's knotweed is considered by CNPS as a plant of limited distribution in California (a watch list species), qualifying it for List 4. It is endemic to California, and is known from Butte,

Shasta, and Tehama Counties, where it is found at elevations ranging from 200 to 4,600 feet (Skinner and Pavlik 1994).

Habitat Association

Bidwell's knotweed grows in chaparral, cismontane woodland, and valley and foothill grassland on volcanic soils (Skinner and Pavlik 1994).

Occurrence in the Project Area

One population of Bidwell's knotweed was located at the Inskip Diversion Dam project site near the proposed access road. There are several hundred plants in this population, located in an annual grassland on the Tuscan Formation. Information on Bidwell's knotweed population occurrences is in Table II-2 in Volume II.

SPECIAL-STATUS WILDLIFE

Thirty-eight special-status wildlife species were identified during the pre-field survey investigation as having the potential to occur in the project area (Table 2-4). The following 11 special-status animals (or their potential habitats) were documented during field surveys in the project area:

- valley elderberry longhorn beetle (VELB) (*Desmocerus californicus dimorphus*),
- northwestern pond turtle (*Clemmys marmorata marmorata*),
- foothill yellow-legged frog (*Rana boylei*),
- osprey (*Pandion haliaetus*),
- bald eagle (*Haliaeetus leucocephalus*)
- sharp-shinned hawk (*Accipiter striatus*),
- Cooper's hawk (*Accipiter cooperii*),
- golden eagle (*Aquila chrysaetos*),
- Vaux's swift (*Chaetura vauxi*),
- little willow flycatcher (*Empidonax traillii brewsteri*), and
- yellow-breasted chat (*Icteria virens*).

The legal status for each species is provided in Table 3-3. The locations of special-status wildlife occurrences documented during field surveys are shown on maps in Volume II (Maps WL-1 through WL-9). Each occurrence is also recorded in Table II-3 in Volume II of this report. Occurrences of some special-status birds are not shown on the maps presented in Volume II because these species were either migrating through the project area (e.g., sharp-skinned and Cooper's hawks) or are not likely to be nesting within the project area (e.g., Vaux's swift). A brief description of each special-status wildlife species follows.

Table 3-3. Special-Status Wildlife Species Detected in the Battle Creek Salmon and Steelhead Restoration Project Area

Common Name	Scientific Name	Legal Status
Listed Species		
Valley elderberry longhorn beetle ¹	<i>Desmocerus californicus dimorphus</i>	Federally listed threatened species
Bald eagle	<i>Haliaeetus leucocephalus</i>	Federally listed threatened species
Sensitive Species and Species of Special Concern		
Amphibians and Reptiles		
Foothill yellow-legged frog	<i>Rana boylei</i>	Federal species of concern
Northwestern pond turtle	<i>Clemmys marmorata marmorata</i>	State species of special concern
Birds		
Osprey	<i>Pandion haliaetus</i>	State species of special concern
Sharp-shinned hawk	<i>Accipiter striatus</i>	State species of special concern
Cooper's hawk	<i>Accipiter cooperii</i>	State species of special concern
Golden eagle	<i>Aquila chrysaetos</i>	State species of special concern, fully protected
Vaux's swift	<i>Chaetura vauxi</i>	State species of special concern
Willow flycatcher	<i>Empidonax traillii</i>	Federal species of concern
Yellow-breasted chat	<i>Icteria virens</i>	State species of special concern
Bats ²		
Fringed myotis	<i>Myotis thysanodes</i>	Federal species of concern
Long-eared myotis	<i>Myotis evotis</i>	Federal species of concern
Small-footed myotis	<i>Myotis ciliolabrum</i>	Federal species of concern
Long-legged myotis	<i>Myotis volans</i>	Federal species of concern
Yuma myotis	<i>Myotis yumanensis</i>	Federal species of concern
Pallid bat	<i>Antrozous pallidus</i>	State species of special concern
Townsend's big-eared bat	<i>Plecotus townsendii</i>	Federal species of concern

Notes:

¹ The valley elderberry longhorn beetle is federally listed as threatened. The species was not observed during the Battle Creek wildlife surveys; however, blue elderberry shrubs that provide potential habitat for the beetle were identified during the Battle Creek field investigations.

² Many unidentified bats were seen at dusk during the Battle Creek wildlife surveys. The species listed here could potentially occur at the Battle Creek project areas.

Valley Elderberry Longhorn Beetle

The VELB is a medium-sized (about 2 cm long) beetle. The Latin term *dimorphus* in its scientific name (*Desmocerus californicus dimorphus*) refers to sexual differences in appearance. The forewings of the female are dark metallic green with red margins, whereas those of the male are primarily red with dark green spots. The beetle's entire life cycle is associated with elderberry trees (*Sambucus* sp.) in California's Central Valley.

The VELB's life history characteristics are assumed to follow a sequence of events similar to those of related taxa (U.S. Fish and Wildlife Service 1984). Females deposit eggs in crevices in the bark of living blue elderberry shrubs found primarily in valley foothill riparian habitats. Presumably, the eggs hatch shortly after they are laid and larvae bore into the pith of the trunk or stem. When larvae are ready to pupate, they work their way through the pith of the shrub, open an emergence hole through the bark, and return to the pith for pupation. Adults exit through the emergence holes and can be found on elderberry foliage, flowers, or stems or on adjacent vegetation. The entire life cycle of the VELB is thought to take 2 years from the time eggs are laid and hatch until adults emerge and die (U.S. Fish and Wildlife Service 1984).

The presence of exit holes in blue elderberry stems is diagnostic of previous VELB use. Exit holes are cylindrical and are approximately 0.25 inch in diameter. Exit holes can be found from a few inches above the ground to about 9–10 feet up on stems ranging from 1 to 8 inches in diameter (Barr 1991).

Status and Distribution

Information on the historical distribution and abundance of VELB is scarce. The VELB may have always been a rare species; however, the substantial reduction in Central Valley riparian vegetation in the last 150 years probably has further reduced the beetle's range and isolated the remaining populations (U.S. Fish and Wildlife Service 1984).

In 1984, the VELB was known to occur in only three Central Valley drainages: Merced River, Putah Creek, and American River (U.S. Fish and Wildlife Service 1984). However, additional field surveys in subsequent years detected new locations of VELB along the Yuba, American, Cosumnes, Sacramento, Mokelumne, Calaveras, San Joaquin, Tuolumne, Stanislaus, and Merced Rivers.

The current range of VELB extends from the northern end of the Central Valley at Redding to the Bakersfield area (Barr 1991). In the foothills of the Sierra Nevada, adult beetles have been found in elevations up to 2,220 feet, and exit holes in elevations up to 2,940 feet (Barr 1991). Along the Coast Ranges, adult beetles have been found up to 500 feet elevation, and exit holes have been detected up to 730 feet elevation (Barr 1991).

Habitat Association

The VELB's entire life cycle is associated with elderberry trees in California's Central Valley and surrounding foothills including up to 3,000 ft. in elevation in the east and the entire watershed to the west.

Reason for Decline

Although the historical distribution of VELB is unknown, extensive loss of riparian forests of the Central Valley during the past 100 years probably resulted in a decrease and fragmentation of the VELB's range (U.S. Fish and Wildlife Service 1984). Insecticide drift from cultivated fields and orchards adjacent to blue elderberry shrubs could affect VELB populations if it occurs when adults are present on the shrubs (Barr 1991). Herbicide drift from agricultural fields and orchards could also negatively affect blue elderberry shrubs and reduce VELB habitat.

The VELB is federally listed as threatened (52803 Federal Register 45, August 8, 1980); it is not listed by the state. The USFWS developed a recovery plan in 1984 (U.S. Fish and Wildlife Service 1984) with the interim objectives of protecting three known localities, surveying riparian areas in the Central Valley to detect other populations of VELB, and protecting the riparian habitats within the VELB's historical distribution. As more information becomes available, the USFWS will determine the number of sites and populations of VELB required before considering delisting the species (U.S. Fish and Wildlife Service 1984).

Occurrence in the Project Area

There are no known VELB occurrences in the study area; however, numerous elderberry plants that provide potential habitat for the beetle were found during field surveys. Information on each elderberry occurrence is in Table II-3 in Volume II.

Northwestern Pond Turtle

The northwestern pond turtle is the only native turtle in northern California and is unlikely to be misidentified. These turtles are dietary generalists that feed primarily on small aquatic invertebrates, such as crustaceans and insects, but they also will feed on carrion. Frogs, small fish, and ducklings have been reported prey items, but it is unknown if they were captured while alive or taken as carrion (Holland 1994).

Status and Distribution

The northwestern pond turtle is designated as a species of concern by Region 1 of the USFWS and a species of special concern by DFG. It currently receives no statutory protection under

the California or federal ESAs. It is a moderate-sized, primarily aquatic turtle endemic to the Pacific Northwest. Two subspecies of western pond turtle are currently recognized, the northwestern and southwestern pond turtles. The former is found in northern California from the Oregon border to the American River, and the latter is found in the coastal areas south of San Francisco. The two subspecies intergrade in the Central and San Joaquin Valleys. It has recently been suggested that a third undescribed subspecies occurs near the Columbia River gorge, and that the three forms may actually represent different species (Holland 1994). Genetic studies are currently underway to resolve this question.

Movements of up to 5 kilometers (km) across terrestrial habitats have been documented in all size classes of northwestern pond turtles. Reasons for such movements are generally unknown, but may be responses to environmental stress, such as drought, or regular movements among a series of ponds (Holland 1994). Male and female home ranges have been estimated at approximately 1 and 0.25 hectare (ha) (2.5 and 0.6 acre), respectively (Bury 1972).

Habitat Association

The northwestern pond turtle inhabits a wide range of fresh or brackish rivers, streams, lakes, ponds, and permanent or ephemeral wetlands. It typically occurs in slow-moving streams, pools, and ponds. In most cases, emergent basking sites, such as rocks, logs, or vegetation, are present. Although northwestern pond turtles are occasionally observed in reservoirs, abandoned gravel pits, stock ponds, and sewage treatment plants, most such sightings are of displaced individuals and do not represent viable populations (Holland 1994, Jennings and Hayes 1994).

The northwestern pond turtle typically nests on gentle slopes in compact soils with a large proportion of silt or clay. Vegetation is usually sparse and consists of grass or forbs. Nests can be from 3 to 402 meters or more away from aquatic habitats (Holland 1994). Rathbun et al. (1992) recommended a 500-meter buffer zone around aquatic habitats to protect nesting habitat.

The characteristics of overwintering habitat and terrestrial habitats used at other times of the year are highly variable. The presence of a duff layer seems to be a general characteristic of such habitats (Holland 1994). The northwestern pond turtle sometimes overwinters in aquatic environments, such as mud bottoms, beneath undercut banks or logs, or in areas of emergent vegetation. Movement between overwintering sites does occur, and turtles have been observed swimming under ice in water with temperatures as low as 1°C.

Northwestern pond turtles may be either largely inactive during the winter or active throughout the year, depending on location and environmental conditions. In some areas, turtles overwinter communally in either aquatic or terrestrial sites. Terrestrial overwintering sites may be up to 500 meters from aquatic habitats and usually consist of burrows in leaf litter or soil (Holland 1994, Jennings and Hayes 1994).

Reasons for Decline

Holland (1994) estimated a 96–98% decline in northwestern pond turtle populations in Oregon, but specific causes were not identified. Habitat destruction from agricultural activities, urbanization, flood control, and water diversion projects are considered primary causes of population decline (Jennings et al. 1992). Jennings and Hayes (1994) hypothesized that observed changes in age class distribution suggest a lack of recruitment that may indicate that destruction of nesting habitat is a significant factor in declines. They identified agricultural or livestock activity as probable causes. However, introduced exotic fish and bullfrogs that prey on young turtles may also be causing decreases in recruitment. In addition, disease and mortality from ingestion of baited hooks could be contributing factors. Although logging activities can affect the quality of aquatic habitats, no evidence exists to suggest that timber harvesting has contributed to regional or statewide population declines.

Occurrence in the Project Area

One adult was found in Ripley Creek, just upstream from the Lower Ripley Creek Feeder. The turtles are likely to occur elsewhere in both forks of Battle Creek, but none were found during field surveys. Information on each northwestern pond turtle observation is in Table II-3 in Volume II.

Foothill Yellow-Legged Frog

The foothill yellow-legged frog is easily distinguished from the rare, and federally listed, red-legged frog by the color of its legs. The foothill yellow-legged frog rarely gives its guttural croaking mating call so, unlike the common bullfrog and tree frogs, it is usually not found by its voice. This frog breeds after the winter river levels have dropped in mid-March to May. It can be distinguished from the mountain yellow-legged frog by its snout, which has a triangular buff-colored patch, and the absence of a dark mask.

Status and Distribution

The foothill yellow-legged frog is designated as a California species of special concern by the DFG. It currently receives no statutory protection under the California or federal ESAs. The foothill yellow-legged frog historically occurred in most Pacific drainages from the Oregon border to the San Gabriel River drainage in Los Angeles County (Jennings and Hayes 1994). The current distribution of the foothill yellow-legged frog is the Coast Ranges and the Transverse Mountains in Los Angeles County. This species is also found along the western side of the Sierra Nevada and in most of northern California west of the Cascade crest (Zeiner et al. 1988).

Habitat Association

Habitat requirements for the foothill yellow-legged frog are shallow, flowing streams with at least cobble-size substrate. It is believed that this substrate provides necessary refuge for larval and postmetamorph stages (Jennings and Hayes 1994). In the warmer part of this species' range, individuals may remain active year-round; in colder areas, individuals may become inactive or hibernate (Zeiner et al. 1988).

Reasons for Decline

Rainfall much higher than average in southern California during spring 1969 is believed to be responsible for the extirpation of the foothill yellow-legged frog south of the Transverse Range. Introduced predatory aquatic species such as fish and bullfrogs, poorly timed water releases from reservoirs, and decreased waterflows that force adults to move into permanent pools where they are more susceptible to predation have contributed to the decline of the foothill yellow-legged frog throughout the rest of its range (Jennings and Hayes 1994).

Occurrence in the Project Area

Adult yellow-legged frogs were found at the Lower Ripley Creek Feeder, Inskip Diversion Dam/South Powerhouse, Soap Creek Feeder, and South Diversion Dam. Information on each yellow-legged frog observation is in Table II-3 in Volume II.

Osprey

In the western hemisphere, ospreys breed in the United States, Canada, and Mexico and migrate to spend the winter from Mexico south to the Amazon Basin. Often seen during migration soaring at great heights, ospreys are well known throughout most of the world. They are very large raptors with bowed and angled wings in flight that give them a characteristic profile. Ospreys are not closely related to any other raptor and is placed in its own subfamily.

Status and Distribution

Osprey is a California species of special concern. It currently receives no statutory protection under the California or federal ESAs. Historically, ospreys were found breeding along the entire length of California, with population centers along the north coast, north interior, Channel Islands, and central and south coasts (Grinnell 1915). Within this range, the distribution was spotty, as evidenced by their rarity in the San Francisco Bay Area (Grinnell and Wythe 1927). By the 1940s, Grinnell and Miller (1944) reported declines and range contraction, particularly in the southern half of the state, including the Channel Islands, central and south coasts, and along the Sacramento and San Joaquin Rivers. Osprey populations declined through the 1960s, especially in the eastern United States, because of eggshell thinning caused by pesticide contamination (Henny and Ogden 1970).

Currently the osprey breeds in northern California from the Cascade Ranges south to Lake Tahoe, and along the north coast south to Marin County. Regular breeding sites include Shasta Lake, Eagle Lake, Lake Almanor, Lake Oroville, New Bullard's Bar, Comanche Reservoir, other inland lakes and reservoirs, and river systems (e.g., Pit River, Sacramento River, Yuba River, and Cache Creek) (Zeiner et al. 1990; Jones & Stokes Associates file data). Ospreys winter in small numbers along the entire coast and in large inland bodies of water, such as the Feather River, Putah and Cache Creeks, American River, Comanche Reservoir, Turlock Reservoir, New Melones Reservoir (Sterling file data, Yee pers. comm.), and Lake San Antonio (Roberson 1985).

Habitat Association

The osprey is associated strictly with large, fish-bearing waters primarily in ponderosa pine through mixed conifer habitats. Nests are constructed on platforms of sticks at the top of large snags, dead-topped trees, on cliffs, or on human-made structures in open forest habitats. The location of nests requires tall, open branched "pilot trees" nearby for landing before approaching the nest and for flight practice by young osprey. The osprey preys mainly on fish and therefore requires open waters for foraging (Zeiner et al. 1990).

Reasons for Decline

Factors leading to the decline of osprey populations include pesticide contamination, nest-tree removal, degradation of the environmental quality of rivers and lakes, boating and other human disturbances in nesting areas, and illegal shooting (Henny et al. 1978). Pesticides have caused reproductive failure in the past (Garber 1972), but reproductive success has increased since the early 1970s (Airoola and Shubert 1981).

Occurrence in the Project Area

One active osprey nest was found in a large yellow pine approximately 1.3 miles downstream from the South Diversion Dam on a hillside on the south bank of the South Fork of Battle Creek. Osprey flying over project sites were observed several times. Information on each osprey observation is in Table II-3 in Volume II.

Bald Eagle

The adult bald eagle's distinctive white-feathered head and tail providing sharp contrast to its dark brown body and wings make it clearly identifiable. The heads and tails of younger birds are mostly brown, and these birds are often mistaken for golden eagles. When fully grown, bald eagles measure 2.5–3.5 feet (0.75–1 m) long, with a wingspan of more than 6.5 feet (2 m). Females

typically are larger than males. Bald eagles tend to be more vocal than most raptors and emit a variety of high-pitched calls (Thelander 1994).

Status and Distribution

Bald eagles winter throughout most of California at lakes, reservoirs, river systems, and some rangelands and coastal wetlands (Zeiner et al. 1990). Almost half of the state's population winters in the Klamath Basin, but the bald eagle also is an uncommon visitor to the Central Valley. Bald eagles are annual winter residents in the San Luis National Wildlife Refuge Complex; sightings have taken place at the West Bear Creek Unit in 1995 and 1999 (San Luis National Wildlife Refuge Complex file data). The breeding range of bald eagles is primarily in mountainous habitats near reservoirs, lakes, and rivers in the northwest corner of the state (California Department of Fish and Game 1989). Fish constitute most of the bald eagle's diet, but wintering birds frequent Central Valley wetlands in search of dead and dying waterfowl and other water birds.

Habitat Association

Bald eagle nesting territories are associated primarily with young or mature forests of varying canopy closure of ponderosa through mixed conifer types, but can be found in all successional stages from blue oak savanna to lodgepole pine types (Verner and Boss 1980). Bald eagles usually nest in overstory ponderosa or sugar pine with foliage shading the nests, within 0.5 mile of a large body of water and with low human disturbance (Verner and Boss 1980). Total canopy closure in stands that support bald eagle nests is usually less than 40 % (Verner and Boss 1980).

Reasons for Decline

Historically, bald eagle populations have declined due to eggshell-thinning from ingestion of dichlorodiphenyltrichloroethane (DDT), shooting, and disturbance of nest sites. However, due to protection under the ESA, their populations have recovered across most of North America and they may soon be delisted.

Occurrence in the Project Area

Adults were seen flying high over both forks of Battle Creek on several occasions during the spring field surveys. An adult bald eagle was observed flying over the Eagle Canyon Diversion Dam site. An immature bald eagle was observed at the Coleman Diversion Dam in mid-June 2000. Bald eagles hunt for fish within the project area; however, no active or inactive nest sites were identified. Bald eagles likely nest outside the project area. Information on each bald eagle observation is in Table II-3 in Volume II.

Sharp-Shinned Hawk

The sharp-shinned hawk is the smallest North American member of the genus *Accipiter*, a group of forest-dwelling hawks with short, rounded wings and a long tail that enables them to maneuver in forested habitat. Of the three species of *Accipiters* in North America, the sharp-shinned hawk is the most specialized in hunting avian prey; birds commonly make up more than 90% of the sharp-shinned hawk's diet during the breeding season (Johnsgard 1990). They can be distinguished from the larger Cooper's hawk by their straight rather than rounded tail tips, their short undertail coverts, and their smaller heads and shorter necks.

Status and Distribution

The sharp-shinned hawk is designated as a species of special concern by DFG. It currently receives no statutory protection under the California or federal ESAs. Found throughout North America, sharp-shinned hawks nest primarily in heavily forested locations with little human disturbance. In California, nest sites are found almost exclusively in forests in the northern Coast Ranges, the Sierra Nevada, and the Cascades. In California, they are relatively rare breeders, primarily in conifer forests of the Sierra Nevada, the coastal forests of northern California, and, in small numbers, the mountain ranges of southern California (Garrett and Dunn 1981). During migration and winter, however, they are common in all habitats (Grinnell and Miller 1944).

Habitat Association

Sharp-shinned hawks typically nest in montane settings with dense, relatively young even-aged conifer stands or deciduous riparian habitats (Reynolds et al. 1982, Moore and Henny 1983, Johnsgard 1990). Nests are usually situated on moderately steep north-facing slopes near water in stands with a high foliage density and often near forest openings or edges (Reynolds et al. 1982, Johnsgard 1990). Estimates of breeding season home ranges vary from 61 to 405 ha (150 to 1,000 acres) (Johnsgard 1990). Reynolds et al. (1982) recommended retention of 4 ha (9 acres) buffer zones around active nests, an area large enough to encompass nearby prey plucking posts. During migration, sharp-shinned hawks can be found in all habitats, but during the winter, they are most frequently found in a variety of forest types, riparian woodlands, and suburban areas with an abundance of prey (small passerine birds).

Reasons for Decline

Sharp-shinned hawks may have never been abundant in California during the breeding season (Grinnell and Miller 1944, Remsen 1978). A possible decline noted in California during the DDT era (Remsen 1978) coincided with declines in eastern populations and probably was attributable to DDT and other pesticides (Bednarz et al. 1990). However, the population status in California is unknown. Timber harvesting has also been suggested as a potential threat to the sharp-skinned hawk population (Remsen 1978).

Occurrence in the Project Area

Several sharp-skinned hawks were seen during spring and fall migration (April and September) at various locations along access roads and project sites. Their specific occurrence during migration is unpredictable but is often tied to local, ephemeral concentrations of prey (small passerine birds). No individuals were observed during the breeding season (June and July); therefore, they are not likely to nest in the project area. Information on each observation of sharp-skinned hawk is not provided in Volume II because those individuals observed in the field were spring and fall migrants and were not nesting in the project area.

Cooper's Hawk

This medium-sized *Accipiter* is larger than the sharp-shinned hawk. Its rounded tail, longer undertail coverts and larger head and neck help in its identification. Cooper's hawks are smaller than northern goshawks, and adults are easily identified by the reddish barring on their underparts and their lack of a white eyestripe. Immatures are much more similar to northern goshawks but often have straight, even white barring on the tail and are smaller and not as broad-winged. Cooper's hawks can be found in a variety of habitats and elevations; however, they are not as closely tied to montane coniferous forests as are sharp-shinned hawks or northern goshawks.

Status and Distribution

The Cooper's hawk is designated as a state species of special concern by DFG. It currently receives no statutory protection under the California or federal ESAs. The historical range of the Cooper's hawk is similar to its current range, although it is less common in the Central Valley than it was historically. Cooper's hawks are found throughout most of the United States, southern Canada, and northern Mexico. Northern populations are said to be migratory and southern populations, resident; however, some southern populations apparently migrate as well (Rosenfield and Bielefeldt 1993). Cooper's hawks breed throughout most of California in a variety of woodland habitats (Grinnell and Miller 1944, Garrett and Dunn 1981). The highest densities probably occur in the foothill oak woodlands of the Sierra Nevada and Transverse Ranges (Asay 1987). In California they are uncommon breeders in much of the state. The Cooper's hawk is found in greater numbers during migration and winter, when they can be found in all habitats throughout California (Grinnell and Miller 1944).

Habitat Association

The Cooper's hawk nests in deciduous, conifer, and mixed woodlands (Garrett and Dunn 1981), but will also nest in urban areas and seems to tolerate human disturbance near the nest (Palmer 1988). The hawks nest and forage near open water or riparian vegetation. Prey comprises

small birds, a variety of small mammals, reptiles, and amphibians (Zeiner et al. 1990). The Cooper's hawk usually breeds after 2 years (Rosenfield 1982, Henny et al. 1985, Asay 1987), and pairs generally return to the same territory year after year and will often build a new nest in the vicinity of the existing one (Reynolds and Wright 1978).

Reasons for Decline

Decline of eastern populations of Cooper's hawk is attributed to pesticide contamination. In the West, declines are less documented but in California have been attributed to habitat destruction, particularly of lowland riparian areas (Remsen 1978). Pesticides may also play a role in declines in western populations.

Occurrence in the Project Area

An immature Cooper's hawk was observed during field surveys performed in July 2000 and was probably dispersing from its natal territory. No adults were observed during field surveys during the breeding season; therefore, they are not likely to nest in the project area. Information on the observation of immature Cooper's hawk is not provided in Volume II because the Cooper's hawk's natal territory likely is not within the project area.

Golden Eagle

One of the largest raptors in the world, the golden eagle is named for the golden crown and nape found on the adults. Immatures can be distinguished from immature bald eagles by their smaller bill and the fact that they have white confined to the bases of their primaries and tail feathers.

Status and Distribution

The golden eagle is designated as a species of special concern by DFG, is a fully protected species under the California Fish and Game Code, and is protected under the federal Bald and Golden Eagle Protection Act. Golden eagles are found throughout western North America, and a few migrate through and winter in parts of the eastern United States. The golden eagle is a permanent resident throughout California, except in the center of the Central Valley, although it winters in this area (Zeiner et al. 1990). Golden eagle populations have declined near human population centers, but overall its population appears stable (Remsen 1978).

Habitat Association

Golden eagles are closely tied to open rangelands, including blue oak savanna. It avoids dense coastal and montane coniferous forests (Small 1994). Golden eagles breed from late January through August, peaking from March through July. Nests are most frequently placed on cliff ledges but may be placed on trees large enough to support their weight. Golden eagles often maintain alternative nest sites and old nests are often reused (Zeiner et al. 1990). The golden eagle needs open areas for hunting. Its diet consists mostly of rabbits and rodents but also includes other mammals, reptiles, birds, and some carrion (Zeiner et al. 1990).

Reasons for Decline

Golden Eagles have declined as a result of shooting, poisoning, and disturbance of nest sites (Remsen 1978).

Occurrence in the Project Area

Golden eagles were found singly and in pairs at a number of locations in the project area. A pair of adult golden eagles were observed flying over the North Battle Creek Feeder Diversion Dam. One adult and one immature golden eagle were also observed flying over the Inskip Diversion Dam/South Powerhouse site. Old, unoccupied nests were found at the headwaters of Soap Creek Feeder and at the South Powerhouse. The eagles sighted may have nested in the region, but because their home range is very large, observations of pairs of golden eagles at a site do not necessarily indicate local nesting. Information on each golden eagle observation is in Table II-3 in Volume II.

Vaux's Swift

Vaux's swift is a migratory, insectivorous bird that nests and roosts in large hollow trees and snags. As with other swifts, the Vaux's swift forages in the air over forest canopy, grasslands, and water. Vaux's swift can be readily distinguished from the larger white-throated swift by its lack of obvious white on the throat and flanks, and from the larger black swift by its squared-off tail, pale brown throat and rump, and narrower wings. Vaux's swift can be readily distinguished from the many species of swallows by its overall dark brown plumage, cigar-shaped body, and twittering wing beats.

Status and Distribution

Vaux's swift is designated as a species of special concern by DFG (Remsen 1978). It currently receives no statutory protection under either the California or federal ESAs. In California, Vaux's swift occurs during the breeding season primarily in the narrow redwood-forested coastal zone from the Oregon border south to Santa Cruz County. It also occurs across the northern portion of the state and in the Sierra Nevada, although apparently at much lower densities (Bull and Collins 1993, Sterling and Paton 1996).

Habitat Association

In California, Vaux's swifts appear to prefer redwood and Douglas-fir forest types (Sterling and Paton 1996), constructing their nests in large hollow trees and snags and burned-out hollows (Bull and Cooper 1991, Bull and Collins 1993). Several investigators have reported an association between presence of Vaux's swift and old growth forests (Manuwal and Huff 1987, Lundquist and Mariani 1991, Bull and Hohmann 1993, Sterling and Paton 1996). However, age and structural characteristics of forest stands may not in themselves be as critical to swifts (Bull 1991 as the need for suitable nest and roost trees, which are more likely to occur in old-growth forests because of the large size and decay conditions of the trees (Bull and Hohmann 1993, Bull and Collins 1993).

Nest trees tend to be large, averaging 32 inches (81 cm) diameter at breast height (dbh) in one study (Bull and Hohmann 1993). However, Bull and Hohmann (1993) also reported limited use of residual snags in second-growth forests, and Dawson (1923) and others (cited in Sterling and Paton 1996) described nests in residual snags in old burns and clearcuts. These findings suggest that retained hollowed trees and snags could continue to provide habitat in regeneration areas. Lundquist and Mariani (1991) recommend retention of snags greater than 76 cm dbh. Vaux's swifts forage on insects and spiders, usually above the canopy, water, and grasslands, but may also take prey near branches inside the canopy (Bull and Collins 1993).

Reasons for Decline

Populations of Vaux's swift declined in Oregon and Washington during the 1980s (the percent annual change was -8% in Oregon and -11% in Washington) (Bull and Collins 1993). Corresponding data for California are lacking (Sterling and Paton 1996). The removal of large snags and hollow trees generally associated with late seral stage forests probably has contributed to population declines (Bull and Collins 1993).

Occurrence in the Project Area

One Vaux's swift was sighted flying over blue oak savanna just outside the project area on June 13, 2000, and a pair was observed at the Lower Ripley Creek Feeder on July 25, 2000. Although the nest location is unknown, these birds are probably nesting in a large snag somewhere within the canyon of either the South or North Fork of Battle Creek at a higher elevation outside of the project area. Information on Vaux's swift is not provided in Volume II because the species is not known to nest in the project area or at the elevation and habitat in California where the swift was observed (Sterling and Paton 1996). Furthermore, the pair of Vaux's swift observed at Lower Ripley Creek Feeder in late July 2000 is best interpreted as birds dispersing from their breeding territory.

Little Willow Flycatcher

The little willow flycatcher can be distinguished from other members of its genus (*Empidonax*) by its loud song, “*fitz-bew*”, and by its lack of a white eye ring. The willow flycatcher differs from the similar western wood-pewee in its song and “*whit*” call note; its lack of the dark, vested look of its breast; its brighter yellow belly; longer tail; paler and greener head and back; broader, more prominent white wing-bars; and its habit of flicking its tail (shared by other *Empidonax*).

Status and Distribution

This subspecies is on the California endangered species list. Historically, the little willow flycatcher was a common nesting species in the Sierra Nevada, Central Valley, and the central and northern Coast Ranges. Now, it is found only in isolated populations mountain meadow systems in the Sierra Nevada and the Cascade Range (Harris et al. 1988; California Department of Fish and Game 1997).

Habitat Association

This flycatcher breeds and forages almost exclusively in wet mountain meadow systems with standing water for at least part of the breeding season (May through July), and with ample numbers of willow and other associated trees and shrubs. It arrives on the breeding grounds in May and June and departs for South America in August (Harris et al. 1988, Zeiner et al. 1990).

Reasons for Decline

The little willow flycatcher has declined for a variety of reasons, including nest parasitism by brown-headed cowbirds, loss and degradation of riparian and meadow habitats, and disturbance of nest sites by cattle (Zeiner et al. 1990; California Department of Fish and Game 1997).

Occurrence in the Project Area

Migrants were found at the Eagle Canyon Diversion Dam and in the riparian habitat at the Lower Ripley Creek Feeder in mid-June 2000. The latter location has appropriate nesting habitat; however, attempts to find the little willow flycatcher during the July breeding season failed. Information on each little willow flycatcher occurrence is in Table II-3 in Volume II.

Yellow-Breasted Chat

The yellow-breasted chat is the largest of the New World warblers. It has a very large head with bright white “spectacles”, bright yellow breast, white belly, and undertail coverts. The head, back, and wings are medium gray. Throughout the year the yellow-breasted chat feeds on insects and spiders, berries, and other fruits.

Status and Distribution

The yellow-breasted chat is designated as a species of special concern by DFG. It currently receives no statutory protection under the California or federal ESAs. It was once common throughout riparian woodland and scrub habitats in California. It is now an uncommon breeder along the coast of California and in the foothills of the central and southern Sierra Nevada, and breeding populations have declined over much of its former range in southern California (Garrett and Dunn 1981). It is increasingly uncommon in the Sacramento Valley and rare in the San Joaquin Valley and Mojave Desert (Garrett and Dunn 1981, Small 1994). The mid-elevation western slope of the northern Sierra Nevada is one of the strongholds for the yellow-breasted chat in California. Yellow-breasted chats are common throughout the riparian habitats in the project area.

The breeding season for the yellow-breasted chat is from early May to early August, peaking in June. As a migratory species, the yellow-breasted chat leaves for wintering grounds in Mexico and Guatemala in September and returns in April (Dunn and Garrett 1997).

Habitat Association

Although generally associated with riparian habitats, chats in the foothills of the Sierra Nevada are very closely tied to blackberry brambles for cover and for foraging (fruit). Yellow-breasted chats build nests in dense riparian habitats, often consisting of willow thickets and tangles of wild grapevine and *Rubus* sp. (Grinnell and Miller 1944, Dunn and Garrett 1997).

Reason for Decline

The loss and fragmentation of riparian habitats are major causes of the decline of the yellow-breasted chat (Garrett and Dunn 1981, Dunn and Garrett 1997). Brood parasitism by the brown-headed cowbird has caused the decline of this species, even in areas with intact riparian habitat (Remsen 1978).

Occurrence in the Project Area

Yellow-breasted chats were observed at four riparian sites that had blackberry brambles and riparian scrub: Darrah Springs Feeder, Coleman Diversion Dam/Inskip Powerhouse, Lower Ripley Creek Feeder, and Inskip Diversion Dam/South Powerhouse.

Information on the occurrences of yellow-breasted chat at Darrah Springs and Coleman Diversion Dam/Inskip Powerhouse is in Table II-3 in Volume II. The occurrences at Lower Ripley Creek Feeder and Inskip Diversion Dam/South Powerhouse are not provided in Volume II because the chats observed at these sites were migrants and do not nest in the area.

Special-Status Bats

Numerous bats were observed foraging over the study area during the field surveys, and roosting bats were observed in abandoned tunnels near the South Powerhouse and at Inskip Diversion Dam. None of these individuals were identified as to species, but the following species have potential to occur in the study area based on their habitats and geographic range: fringed myotis, long-eared myotis, small-footed myotis, long-legged myotis, Yuma myotis, pallid bat, and Townsend's big-eared bat. All of these species are considered federal species of concern, and known roosting sites should be protected with a steel mesh or bat door that permits access by bats but not by humans or predators.

Chapter 4. Constraints Analysis and Potential Mitigation Measures

In general, biological resources in the project area could be directly and indirectly affected during restoration by the following activities:

- grading and excavating associated with the removal of existing structures and construction of new features;
- filling or plugging of tunnels that could be occupied by bats;
- temporary stockpiling or sidecasting of soil or other materials;
- dragging and chopping of materials;
- removing materials by helicopter;
- using minor equipment staging areas and access roads;
- constructing new access roads;
- introducing or spreading existing noxious weeds during construction;
- parking vehicles temporarily in areas that support special-status plant populations (sites not designated as equipment staging areas); and
- disturbing local environment through noise, artificial lighting, and dust related to construction.

Table 4-1 summarizes the potential resource issues and possible mitigation measures for each of the project sites. The mitigation measures in this table should be considered recommendations at this time; they will be finalized after preparation of project impact analyses and discussions with the U.S. Bureau of Reclamation, DFG, and other resources agencies. The final impact discussion and mitigation measures will be presented in detail in the biological resource section of the Restoration Project environmental impact report/environmental impact statement.

Table 4-1. Summary of Biological Resource Issues and Possible Mitigation Measures for the Battle Creek Salmon and Steelhead Restoration Project^a

Restoration Project Site ^b	Biological Resource Issues ^c	Possible Mitigation Measures ^d
North Battle Creek Feeder Diversion Dam	Removal of woody riparian vegetation along North Fork Battle Creek	<p>Avoid the removal of woody riparian vegetation by installing orange construction barrier fencing around woody riparian vegetation near the construction zone, educating construction crews about the importance of avoiding the sensitive habitat, and monitoring construction to ensure avoidance.</p> <p>Minimize long-term impacts on woody riparian vegetation by trimming trees and shrubs rather than removing the entire woody species. Where possible, shrubs and trees should be cut at least 1 foot above ground level to leave the root systems intact and allow for more rapid regeneration of the species. Vegetation removal should be avoided in areas that provide habitat for sensitive species. Take under the Migratory Bird Treaty Act (50 CFR 10 and 21) is defined as the act or attempt to “pursue, hunt, shoot, capture, collect or kill” any migratory bird, including eggs or nestlings; knowledge or intent is not required for a person or entity to be held liable. To ensure that there is no take of migratory birds without a permit as required by the Migratory Bird Treaty Act, woody riparian vegetation removal should be avoided during the nesting season, from March 15 to August 15, to prevent destruction of eggs and/or nestlings in nests.</p> <p>Compensate for unavoidable vegetation removal by replanting or enhancing riparian habitat on or near the restoration site. Enhancement or revegetation should be done at a minimum 1:1 ratio (1 acre replanted/enhanced for every 1 acre removed). This mitigation ratio and a monitoring program should be developed through coordination with state and federal resource agencies involved in the project.</p>
	Removal of mixed conifer/hardwood forest during access road construction	Minimize forest habitat removal by confining construction to the minimum area necessary. This would involve staking and flagging the work zone prior to construction and monitoring construction activities to ensure that impacts are minimized and erosion control measures have been installed for short-term and long-term site stabilization.
	Potential disturbance of California spotted owl breeding and winter roost sites, a state species of special concern	Conduct spring and summer surveys for California spotted owl. If owls are present, avoid construction activities during the breeding season: March 15 through August 31. Conduct winter surveys for California spotted owls. If owls are present, avoid construction activities during winter roosting season: September 1 to March 15.

Table 4-1. Continued

Restoration Project Site ^b	Biological Resource Issues ^c	Possible Mitigation Measures ^d
Eagle Canyon Diversion Dam	Removal of woody riparian vegetation along North Fork Battle Creek	See the recommendations described above for potential impacts on riparian habitat at the North Battle Creek Feeder Diversion Dam site.
	Placement of fill material into or indirect disturbance (e.g., alteration of hydrology) of a U.S. Army Corps of Engineers (Corps) jurisdictional wetland	Avoid impacts on jurisdictional wetlands, where possible, by installing orange construction barrier fencing around wetlands located near the construction zone, educating construction crews about the importance of avoiding the wetlands, and monitoring construction to ensure avoidance. Minimize and compensate for impacts on jurisdictional wetlands by implementing any compensatory measures outlined in the Section 404 permit from the Corps.
	Removal of 2 blue elderberry shrubs, the habitat of the valley elderberry longhorn beetle (VELB) (<i>Desmocerus californicus dimorphus</i>), a federally listed threatened species	Transplant or replace the 2 elderberry plants that cannot be avoided by the project. Transplantation would be done during the dormant period approximately from November to mid-February with a qualified biologist monitoring potential unauthorized take. At U.S. Fish and Wildlife Service (USFWS) discretion, the plants can be exempted from transplantation if they cannot be transplanted because of access problems. Compensate for the loss of VELB habitat by creating a conservation area, planting elderberry and native plants, and monitoring their survival following USFWS conservation guidelines—8 elderberry rooted cuttings and 8 cuttings from other native species.
Wildcat Diversion Dam	Disturbance of woolly meadowfoam (<i>Limnanthes floccosa</i> ssp. <i>Floccosa</i>), a CNPS List 4 species	Avoid impacts on CNPS List 4 plants by staking and flagging and avoiding disturbance activities, if possible. Minimize impacts on CNPS List 4 plants by conducting restoration activities in areas that support the species after the plants have flowered and set seed (generally after June).
	Disturbance of seasonal drainages and removal of woody riparian vegetation along North Fork Battle Creek and 2 seasonal drainages	See the recommendations described above for potential impacts on the riparian habitat at the North Battle Creek Feeder Diversion Dam site. As a riparian mitigation option, Chinese tree-of-heaven, an invasive species that occurs in the riparian corridor on this site, could be removed and replaced with native riparian species. Minimize disturbance to seasonal drainages during construction and reestablish pre-project bed and bank contours.
Coleman Diversion Dam/Inskip Powerhouse	Disturbance of woolly meadowfoam (<i>Limnanthes floccosa</i> ssp. <i>floccosa</i>), a CNPS List 4 species	See the recommendations described above for the potential impacts on CNPS List 4 plants at the Wildcat Diversion Dam site.
Coleman Diversion	Disturbance of seasonal drainages and removal of	See the recommendations described above for potential impacts on the riparian habitat at

Table 4-1. Continued

Restoration Project Site ^b	Biological Resource Issues ^c	Possible Mitigation Measures ^d
Dam/Inskip Powerhouse (continued)	woody riparian vegetation along South Fork Battle Creek and 1 seasonal drainage	the North Battle Creek Feeder Diversion Dam and for potential impacts on seasonal drainages at the Wildcat Diversion Dam sites. As a riparian mitigation option, Scotch broom, an invasive species that occurs in the riparian corridor on this site, could be removed and replaced with native riparian species.
	Placement of fill material into or indirect disturbance (e.g., alteration of hydrology) of a Corps jurisdictional wetlands	See the recommendations described above for potential impacts on the wetland at the Eagle Canyon Diversion Dam site.
	Direct removal or indirect disturbance of mature, sapling, and seedling-sized native oak trees	Avoid mature oak trees by installing orange construction barrier fencing outside the tree driplines, educating construction crews about the importance of avoiding the native oaks, and monitoring construction to ensure avoidance.
		Minimize potential long-term impacts on oaks by trimming branches that fall over access roads or construction zones and avoiding parking and excavation in the root zone.
		Compensate for the removal of oaks by developing an oak replacement plan. The plan should include collecting acorns from the local region; planting the acorns on-site at a predetermined ratio based on diameter at breast height (DBH) of the removed trees; and monitoring for a predetermined time period (e.g., 5 years) to evaluate the success criteria.
Lower Ripley Creek Feeder	Disturbance or removal of blue elderberry shrubs, the habitat of the valley elderberry longhorn beetle (VELB) (<i>Desmocerus californicus dimorphus</i>), a federally listed threatened species	Avoid blue elderberry shrubs by installing orange construction barrier fencing around elderberry shrubs within 100 feet of the construction zone, educating construction crews about the importance of avoiding the sensitive habitat, and monitoring construction to ensure avoidance. No ground-disturbing activities will be permitted within 25 feet of the elderberry shrub.
	Disturbance of breeding habitat of yellow-breasted chat (<i>Icteria virens</i>), a state species of special concern	Avoid disturbance or removal of blackberry bramble and riparian vegetation (yellow-breasted chat habitat), where possible, by flagging or installing an orange construction barrier prior to construction.
		Limit construction activities to nonbreeding season of yellow-breasted chats from mid-July to mid-April to avoid noise disturbance to this species.
Lower Ripley Creek Feeder (continued)	Disturbance of woolly meadowfoam (<i>Limnanthes floccosa</i> ssp. <i>floccosa</i>), a CNPS List 4 species	See the recommendations described above for the potential impacts on the woolly meadow at the Wildcat Diversion Dam site.
Lower Ripley Creek Feeder (continued)		See the recommendations provided for the riparian habitat at the North Battle Creek Feeder Diversion Dam site and for potential impacts on seasonal drainages at the Wildcat

Table 4-1. Continued

Restoration Project Site ^b	Biological Resource Issues ^c	Possible Mitigation Measures ^d
Wilcox Springs	Diversion Dam site.	Avoid in-water work in the creek channel during the breeding season (mid-March to mid-June).
	Disturbance of foothill yellow-legged frog (<i>Rana boylei</i>) and northwestern pond turtle (<i>Clemmys marmorata marmorata</i>), both state species of special concern and federal species of concern	Qualified and permitted biologists will survey the dam area and vehicle crossing for frogs and turtles for 3 days prior to dam removal. If the stream does not have flowing water, biologists will search for residual pools. They will relocate special-status amphibians and reptiles to the nearest suitable habitat along the creek. Barrier fencing will be constructed four days prior to dam removal along each side of the work area to prohibit animals from re-entering the work area. After dam removal, barrier fencing will be removed and the habitat will be restored to its original scope and conditions.
	Disturbance of breeding yellow-breasted chat (<i>Icteria virens</i>), a state species of special concern and a federal species of concern	See the recommendations described above for the potential impacts on yellow-breasted chat habitat at the Coleman Diversion Dam/Inskip Powerhouse site.
	Disturbance or removal of blue elderberry shrubs, the habitat of the valley elderberry longhorn beetle (VELB) (<i>Desmocerus californicus dimorphus</i>), a federally listed threatened species	See recommendation described above for potential impacts on VELB habitat at the Coleman Diversion Dam/Inskip Powerhouse site.
Inskip Diversion Dam/South Powerhouse	Disturbance of depauperate milk-vetch (<i>Astragalus pauperculus</i>) and shield-bracted monkeyflower (<i>Mimulus glaucescens</i>), a CNPS List 4 species	See the recommendations described above for potential impacts on the CNPS List 4 plant at the Wildcat Diversion Dam site.
	Placement of fill material into or indirect disturbance (e.g., alteration of hydrology) of Corps jurisdictional wetlands	See the recommendations described above for the potential impacts on wetlands at the Eagle Canyon Diversion Dam site.
	Disturbance of seasonal and perennial drainages with woody riparian vegetation	See the recommendations described above for potential impacts on the riparian habitat at the North Battle Creek Feeder Diversion Dam and for potential impacts on seasonal drainages at the Wildcat Diversion Dam sites. As a riparian mitigation option, Scotch broom, an invasive species that occurs in the riparian corridor on this site, could be removed and replaced with native riparian species.
Inskip Diversion Dam/South Powerhouse (continued)	Direct removal or indirect disturbance of mature, sapling, and seedling-sized native oak trees	See the recommendations described above for potential impacts on oak trees at the Coleman Diversion Dam/Inskip Powerhouse site.

Table 4-1. Continued

Restoration Project Site ^b	Biological Resource Issues ^c	Possible Mitigation Measures ^d
	Disturbance of breeding yellow-breasted chat (<i>Icteria virens</i>), a state species of special concern	See the recommendations described above for potential impacts on yellow-breasted chat habitat at the Coleman Diversion Dam/Inskip Powerhouse site.
	Disturbance of bats in canal tunnels	Avoid disturbance by constructing bat doors or placing rebar over canal tunnel openings. Avoid plugging or filling in tunnels.
	Occurrences of foothill yellow-legged frog (<i>Rana boylei</i>), a state species of special concern and federal species of concern	Avoid in-water work in the creek channel during the breeding season (mid-March to mid-June).
	Disturbance of nesting raptors, protected under Sections 3503 and 3503.5 of the California Fish and Game Code	Monitor nests beginning in February to determine occupancy of nests. If nests are occupied, limit helicopter flights and other activities near nest to the non-breeding season: mid-July to February. Create 0.5-mile-radius line-of-sight buffer for eagle and large falcon nests, a 500-foot-radius buffer for osprey, Cooper's hawk and sharp-shinned hawk nests.
	Disturbance or removal of blue elderberry shrubs, the habitat of the valley elderberry longhorn beetle (VELB) (<i>Desmocerus californicus dimorphus</i>), a federally listed threatened species	See recommendation described above for the potential impacts on VELB habitat at the Coleman Diversion Dam/Inskip Powerhouse site.
Soap Creek Feeder	Disturbance of depauperate milk-vetch (<i>Astragalus pauperculus</i>), a CNPS List 4 species	See the recommendations described above for the potential impacts on a CNPS List 4 plant at the Wildcat Diversion Dam site.
	Disturbance of woody riparian vegetation along Soap Creek and disturbance of two seasonal drainages	See the recommendations described above for potential impacts on the riparian habitat at the North Battle Creek Feeder Diversion Dam and for potential impacts on seasonal drainages at the Wildcat Diversion Dam site.
	Disturbance of foothill yellow-legged frog (<i>Rana boylei</i>), a state species of special concern and federal species of concern	See the recommendations described above for potential impacts on foothill yellow-legged frog habitat at the Lower Ripley Creek Feeder site.

Table 4-1. Continued

Restoration Project Site ^b	Biological Resource Issues ^c	Possible Mitigation Measures ^d
South Diversion Dam/South Battle Creek Canal	Disturbance of depauperate milk-vetch (<i>Astragalus pauperculus</i>) and shield-bracted monkeyflower (<i>Mimulus glaucescens</i>), CNPS List 4 species	See the recommendations described above for the potential impacts on CNPS List 4 plants at the Wildcat Diversion Dam site.
	Disturbance of seasonal drainages and removal of woody riparian vegetation from South Fork Battle Creek and eight seasonal drainages	See the recommendations described above for potential impacts on the riparian habitat at the North Battle Creek Feeder Diversion Dam and for potential impacts on seasonal drainages at the Wildcat Diversion Dam site.
	Placement of fill material into or indirect disturbance (e.g., alteration of hydrology) of Corps jurisdictional wetlands (along access road)	See the recommendations described above for potential impacts on the wetland at the Eagle Canyon Diversion Dam site.
	Disturbance of foothill yellow-legged frog (<i>Rana boylei</i>), a state and federal species of concern	See the recommendations described above for potential impacts on foothill yellow-legged frog habitat at the Lower Ripley Creek Feeder site.
	Disturbance of bats in canal tunnels	See the recommendations described above for potential impacts on bats at the Inskip Diversion Dam/South Powerhouse site.
	Disturbance of nesting raptors	See the recommendations described above for the potential impacts on nesting raptors at the Inskip Diversion Dam/South Powerhouse site.
	Disturbance of active osprey nest (state species of special concern)	Avoid potential impacts on active osprey nest by limiting helicopter flights near nest to nonbreeding season (August 1 to February 1).

Notes:

- ^a The following special-status wildlife species were observed in the project area during field surveys but are not discussed in this table because they will not be affected during restoration activities: Vaux's swift, Cooper's hawk, and sharp-shinned hawk.
- ^b The restoration project sites include all project features, including dams, flumes, canals, existing and proposed access roads, and potential staging areas.
- ^c The resource issues identified in this table should be considered preliminary and will be refined once the final engineering information is available. Impacts on resources (e.g., riparian habitat) will be quantified and discussed in more detail in the environmental impact report/environmental impact statement (EIR/EIS).
- ^d The mitigation measures presented in this table are preliminary recommendations and will be refined based on EIR/EIS impact analyses and during discussions with the U.S. Bureau of Reclamation, USFWS, California Department of Fish and Game, the Corps, California Department of Water Resources, National Marine Fisheries Service, and Pacific Gas and Electric Company.

Chapter 5. List of Preparers

The following persons prepared this report:

Ted Beedy, Ph.D., Senior Wildlife Biologist, Jones & Stokes

Susan Bushnell, Senior Botanist, Jones & Stokes

Brad Schafer, Botanist, Jones & Stokes

John Sterling, Wildlife Biologist, Jones & Stokes

Chapter 6. Citations

PRINTED REFERENCES

- Abrams, L., and R. S. Ferris. 1960. Illustrated flora of the Pacific states. Stanford University Press. Stanford, CA.
- Airola, D. A., and N. Shubert. 1981. Reproductive success, nest site selection, and management of ospreys at Lake Almanor, California. CAL-NEVA Wildlife Transactions 1981:79-85.
- Asay, C. E. 1987. Habitat and productivity of Cooper's hawks nesting in California. California Fish and Game 73:80-87.
- Barr, C. B. 1991. The distribution, habitat, and status of the valley elderberry longhorn beetle. U.S. Fish and Wildlife Service. Sacramento, CA.
- Bednarz, J. C., D. Klem, Jr., L. J. Goodrich, and S. E. Senner. 1990. Migration counts of raptors at Hawk Mountain, PA, as indicators of population trends, 1934-1986. Auk 107: 96-109.
- Bull, E. L., and H. D. Cooper. 1991. Vaux's swift nests in hollow trees. Western Birds 22:85-91.
- Bull, E. 1991. Summer roosts and roosting behavior of Vaux's swifts in old-growth forests. Northwestern Naturalist. 72:78-82.
- Bull, E. L. and R. C. Collins. 1993. Diet and foraging behavior of Vaux's swifts in northeastern Oregon. Condor 95:1016-1023.
- Bull, E. L. and J. E. Hohmann. 1993. The association between Vaux's swifts and old growth forests in northwestern Oregon. Western Birds 24:38-42.
- Bury, R. B. 1972. Habits and home range of the Pacific pond turtle, *Clemmys marmorata*, in a stream community. Ph.D. dissertation. University of California, Berkeley.
- California Department of Fish and Game. 1989. At the crossroads. A report on the status of California's endangered and rare fish and wildlife. December. Sacramento, CA.
- California Department of Fish and Game. 1997. Annual report on the status of California state listed threatened and endangered plants and animals. Sacramento, CA.

- California Department of Fish and Game. 2000. Natural Diversity Data Base records search for 7.5-minute U.S. Geological Survey quadrangles. Sacramento, CA. Unpublished data.
- California Native Plant Society. 2000. California Native Plant Society's inventory of rare and endangered vascular plants of California. 6th edition. California Native Plant Society. Sacramento, CA.
- Dawson, W. L. 1923. The birds of California. Volume III. South Moulton Company. Los Angeles, CA.
- Dunn, J. and K. Garrett. 1997. A Field Guide to the Warblers of North America. Houghton Mifflin. Boston and New York.
- Environmental Laboratory. 1987. U.S. Army Corps of Engineers. Wetland Delineation Manual.
- Garber, D. P. 1972. Osprey nesting ecology in Lassen and Plumas counties, California. M.S. thesis, Humboldt State University. Arcata, California.
- Garrett, K., and J. Dunn. 1981. Birds of Southern California: status and distribution. Los Angeles Audubon Society. Los Angeles, CA.
- Grinnell, J., and A. H. Miller. 1944. The distribution of the birds of California. Cooper Ornithological Club. Berkeley, CA. Reprinted in 1986. Artemisia Press. Lee Vining, CA.
- Grinnell, J. and M. W. Wythe. 1927. Directory to the birdlife of the San Francisco Bay region. Pacific Coast Avifauna number 18. Berkeley, CA.
- Grinnell, J. 1915. A distributional list of the birds of California. Pacific Coast Avifauna number 11. Berkeley, CA.
- Harris, J. H., S. D. Sanders, and M. A. Flett. 1988. The status and distribution of the willow flycatcher in California, 1986. California Department of Fish and Game, Wildlife Management Branch Administrative report 87-2.
- Henny, C. J., D. J. Dunaway, R. D. Mullette, and J. R. Koplín. 1978. Osprey distribution, abundance, and status in western North America: II. The northern California population. Northwest Science 52:261–271.
- Henny, C. J. and J. C. Ogden. 1970. Estimated status of osprey populations in the United States. Journal of Wildlife Management 34:214–217.
- Henny, C. J., R. A. Olson, and T. L. Fleming. 1985. Breeding chronology, molt and measurements of accipiter hawks in northeastern Oregon. J. Field Ornithol. 56:97–112.

- Hickman, J. C. (ed.). 1993. The Jepson manual: higher plants of California. University of California Press. Berkeley, CA.
- Hitchcock, A. S., and A. Chase. 1971. Manual of grasses of the United States. Vols. 1 and 2. Dover Publications. New York, NY.
- Holland, D. C. 1994. The western pond turtle: habitat and history. Final report. Prepared for: U.S. Department of Energy, Bonneville Power Administration, Environment, Fish and Wildlife. Portland OR.
- Holland, R. F. 1986. Preliminary description of the terrestrial vegetation of California. California Resources Agency, Department of Fish and Game. Sacramento, CA.
- Janeway, L. P. 1992. The Cyperaceae of Butte County, California, Part 1: Carex. Studies from The Herbarium, California State University, Chico. Number 9. Chico, CA.
- Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final report. California Department of Fish and Game, Inland Fisheries Division. Rancho Cordova, CA.
- Jennings, W. B., D. F. Bradford, and D. F. Johnson. 1992. Dependence of the garter snake *Thamnophis elegans* on amphibians in the Sierra Nevada of California. Journal of Herpetology 26(4):503–505.
- Johnsgard, P. A. 1990. Hawks, eagles, and falcons of North America. Smithsonian Institution Press. Washington, DC.
- Jones & Stokes. 2001. Preliminary delineation of waters of the United States for the Battle Creek Salmon and Steelhead Restoration Project, Tehama and Shasta Counties, California. Administrative Draft. February. (J&S 00050). Prepared for Navigant Consulting, Inc., Rancho Cordova, CA, in association with the U.S. Bureau of Reclamation, Sacramento, CA.
- Lundquest, R. W. and J. M. Mariani. 1991. Nesting habitat and abundance of snag-dependent birds in the southern Washington and Cascade Range, in Wildlife and vegetation communities of unmanaged Douglas-fir forests (L.F. Ruggiero, K.B. Aubry, A.B. Carey, and M.H. Huff, eds.), pp. 221–240. U.S. Forest Service General Technical Report PNW-GTR-285.
- Manuwal, D. A. and M. H. Huff. 1987. Spring and winter bird populations in a Douglas-fir sere. Journal of Wildlife Management. 51:586-595.
- Moore, K. R. and C. J. Henny. 1983. Accipiter nest sites in Oregon. Raptor Research 17:65–76.
- Munz, P. A., and D. D. Keck. 1968. A California flora and supplement. University of California Press. Berkeley, CA.

- Nelson, J. R. 1987. Rare plant surveys: techniques for impact assessment. Pages 159–166 in T. S. Elias (ed.), Conservation and management of rare and endangered plants. California Native Plant Society. Sacramento, CA.
- Oswald, V. H., and L. Ahart. 1994. Manual of the vascular plants of Butte County, California. California Native Plant Society. Sacramento, CA.
- Palmer, R. S. (ed.). 1988. Handbook of North American birds. Volume 4. Yale University Press. New Haven, CT.
- Rathbun, G., N. Seipel and D. Holland. 1992. Nesting behavior and movements of western pond turtles, *Clemmys marmorata*. SW Natural 37:319–324.
- Remsen, J. V. 1978. Bird species of special concern in California. Prepared for the California Department of Fish and Game. Sacramento, CA.
- Reynolds, R. T., and H. M. Wight. 1978. Distribution, density, and productivity of accipiter hawks breeding in Oregon. Wilson Bulletin 90:182–196.
- Reynolds, R. T., E. C. Meslow, and H. M. Wight. 1982. Nesting habitat of coexisting accipiters in Oregon. J. Wildl. Manage. 46:124–38.
- Roberson, D. 1985. Monterey birds. Monterey Peninsula Audubon Society. Pacific Grove, CA.
- Rosenfield, R. N. 1982. Male Cooper's hawk breeds in juvenile plumage. Wilson Bulletin 94:213.
- Rosenfield, R. N., and J. Bielefeldt. 1993. Cooper's hawk (*Accipiter cooperii*) in: A. Poole and F. Gill (eds.), The Birds of North America, No. 75. Philadelphia, PA: The Academy of Natural Sciences; Washington, DC. The American Ornithologists' Union.
- Sawyer, J. O., and T. Keeler-Wolf. 1995. A manual of California vegetation. California Native Plant Society. Sacramento, CA.
- Skinner, M. W., and B. M. Pavlik. 1994. California Native Plant Society's inventory of rare and endangered vascular plants of California. (Publication No. 1.) 5th edition. California Native Plant Society. Sacramento, CA.
- Small, A. 1994. California birds: their status and distribution. Ibis Publishing Company. Vista, CA.
- Sterling, J. 1999. Shasta and Tehama County Bird Lists from California Bird Lists. Smithsonian Migratory Bird Center, Washington, DC. <http://natzoo.si.edu/smbc/bird%20lists/county.htm>

- Sterling, J., and P. Paton. 1997. Breeding distribution of Vaux's swift in California. *Western Birds* 27:30–40.
- Thelander, C. G (ed.). 1994. *Life on the edge; a guide to California's endangered natural resources*. Biosystems Books. Santa Cruz, CA.
- U.S. Fish and Wildlife Service. 1984. Valley elderberry longhorn beetle recovery plan. Portland, OR.
- Verner, J., and A. S. Boss (tech. coords.). 1980. California wildlife and their habitats: western Sierra Nevada. General Technical Report PSW-37. U.S. Forest Service, Pacific Southwest Forest and Range Experiment Station. Berkeley, CA.
- Welsh, H., Jr. 1987. Monitoring Herpetofauna in Woodland Habitats of Northwestern California and Southwestern Oregon: A Comprehensive Strategy *in* Proceedings of the Symposium on Multiple-Use Management of California's Hardwood Resources. General Technical Report PSW-100.
- Zeiner, D., W. Laudenslayer, Jr., and K. Mayer. 1988. California's Wildlife, Volume 1: Amphibians and Reptiles. California Department of Fish and Game. Sacramento, CA.
- Zeiner, D., et. al. 1990a. California's Wildlife, Volume III: Mammals. California Department of Fish and Game. Sacramento, CA.
- Zeiner, D., et. al. 1990b. California's Wildlife, Volume II: Birds. California Department of Fish and Game. Sacramento, CA.

PERSONAL COMMUNICATIONS

- Paquin-Gilmore, Sharon. Battle Creek Watershed Conservancy. Shasta and Tehama Counties, CA. December 20, 2000—email regarding the Battle Creek Watershed Conservancy Noxious Weeds Removal Program.
- Tibor, David. Botanist. California Native Plant Society. Sacramento, CA. August 24, 2000—email regarding the California Native Plant Society listing for Butte County fritillary (*Fritillaria eastwoodiae*).
- Welsh, Dr. Hartwell. Research Wildlife Ecologist. Redwood Sciences Laboratory, Pacific Southwest Research, U.S. Department of Agriculture Forest Service. Arcata, CA. June 13, 2000—Discussion of potentially occurring amphibian species in the Battle Creek project area and discussion of survey methods for *Hydromantes* salamanders.